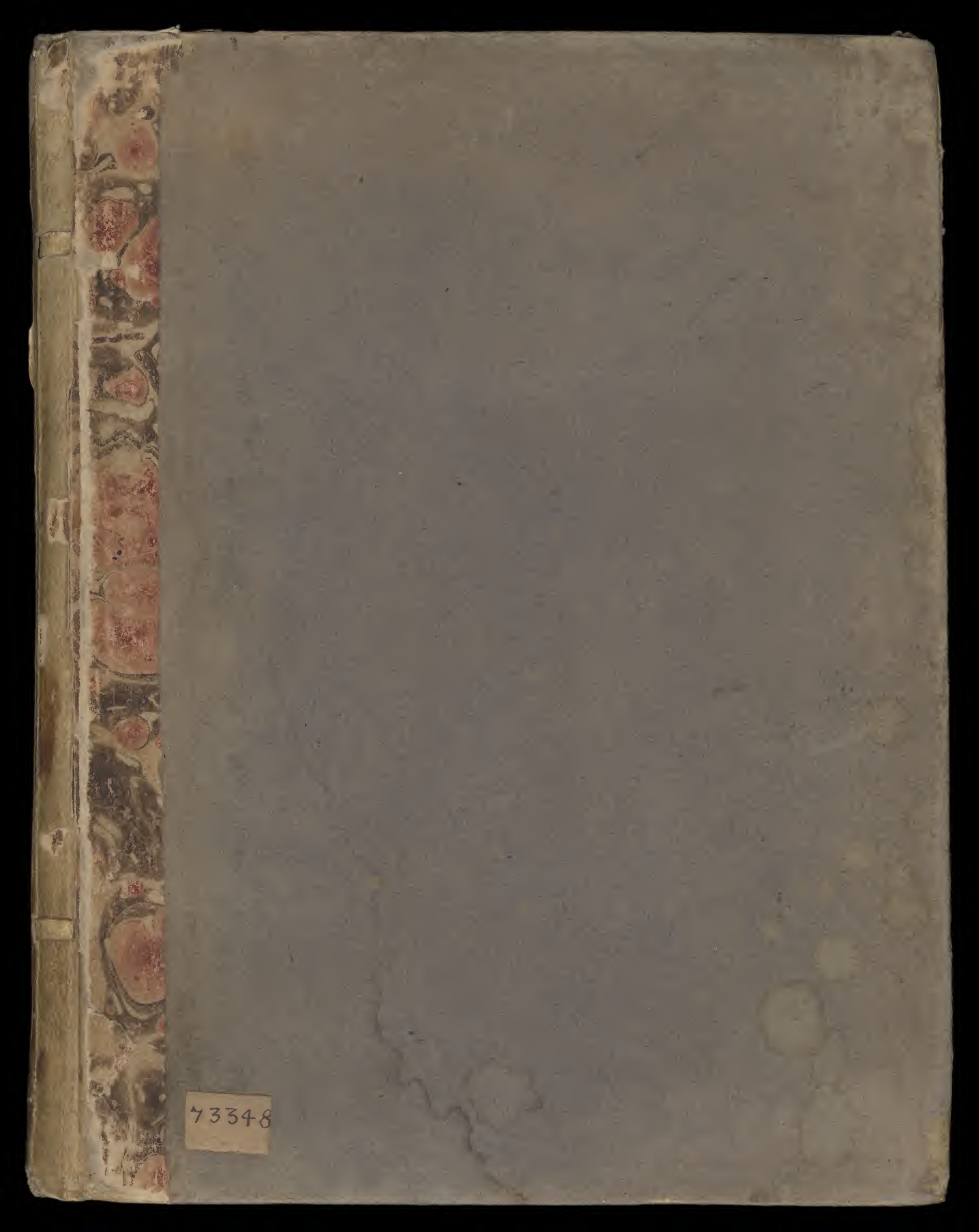




73348

Charms on bleaching 3 vo: Robinson's, 99
 of stones, see Tourcroy's ^{System of} Chemistry, books
 see Kirwan's Mineralogy 4 Vol:
 Dr. Thomson's system of Chemistry 4 Vol:
 gar -- Tomoke it see Tourcroy Vol 8th - 250
 water -- Bouillon la Grange's Chemistry 1 Vol: 93.
 separate from their ores - see Kirwan's Mineralogy,
 Schlutter's work on Mineralogy; Henckels Pyritologia;
 Cramer on metals; Hlaproth's Essays;
 Dr. Thompson System of Chem^y. Vol: 4th 174.
 of various articles of Iron see Parkes's Chem^y Cat. n 512.
 Powder - is a phosphate of lime & antimony. For a method
 of preparing it consult Phil^y Mag. 182: 11th.
 for reflect^y. telescopes: The use of arsenic in
 the preparation of them, see the paper on
 the subject, by the Rev^d. Mr. Edwards
 of Ludlow, in the nautical Almanac for
 1787.

Substances used by Dyers. — 73348

D^o used by calico printers see next page.

Sal-ammoniac - is used to form what they call composition;
it is employed to prevent the tin from precipitating.

Ammonia is also used for same purposes. Parker's Chim. Est. p. 203

Oxyd of lead — D^o — D^o 399

Arsenic, generally combined with potash. Parmentier has long
made a trade of preparing this salt for the French
Dyers — D^o 416

Extriment of Realgar, are both sulphures of arsenic & are
much used in dyeing. — D^o 416



ACCESSION NUMBER

73348

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Substances used by Dyers. — 73348

De — used by calico printers see next page.

Sal-ammoniac — is used to form what they call composition;
the tin from precipitating.

paraphrase — Parkes' Chim. Est. Vol. 203

De — 290

De — 399

with potash. Baume has long
of this salt for the French
De 416

the sulphur of arsenic & is
De 416

23
1853

Substances used by Calico printers, for Dyeing, Dyed see the page
the page 416,

Oxalic acid, in a state of purity & in combination
with potash. — *Parker's Chem. Catalogue* Page 239.

Citric acid ————— *Do.*
or tartaric acid — to discharge false prints ————— *Do.* 240

Oxalic acid, — is become an article of great consumption
with calico printers, both in a state of purity
& in combination with potash. *Parker's Chem. Catalogue* 239

Obrian wrote a book on calico printing, as ment. by
a Minstr. bookseller. — }

Oxide of lead ————— *Parker's Chem. Catalogue* 399

The mordant from alum & acetate of lead, an easy way of
preparing it see Rees's new Cyclopaedia — ~~Do.~~
to whom *Parker's* in his *Chem. Catalogue* refers 501.

Oxalate of potash, is consumed by calico printers in great
quantities. — it is found ready formed in the juice
of the wood-sorrel, in a state of superoxalate.

Sulphuret of arsenic is much used in calico printing, on account
of its property of readily dissolving indigo. — *Parker's Chem. Catalogue* 288.
& Realgar are both sulphurets of arsenic & are much used
in calico printing & dyeing. — *Do.* 416

1

To make Blacking, Military
Book -

10 lb Bees Wax
9 — Ivory Black
3 — Soft Soap
3 — Yellow D.

25 lb — will make 30 Balls worth
1 lb each. —

Book for young people
The Bees Wax to be cut small & melted
separately — both kinds of soap put in
together after the harder sort being cut
small — stir them whilst boiling
till melted — then take them off the
fire & put in the Ivory Black gradually
stir them again — when done
put it on the Table or board & when
cool enough to handle work it well
the hand before it is formed into
the shape required & let them be kept 2 or 3
days before they are used. —

Substances used by Calico printers, for Dyeing, &c. see the

Oxalic acid, in a state of purity, & in combination
with potash. — ^{See below} Parkes' Chem. Calico. Page 229.

Citric acid ————— Dr.
tartaric acid — to discharge false prints ————— Dr. 240

Oxalic acid, — is become an article of great consumption
with calico printers, both in a state of purity,
& in combination with potash. Parkes' Ch. Calico.

Obrian wrote a book on calico printing, as ment^d by
a Minstr. bookseller. — }

Oxyd of lead ————— Parkes' Ch. Calico 39

The mordant from alum & acetate of lead, an easy way of
preparing it see Rees's new Cyclopaedia — ~~Dr.~~
to whom Parkes in his Chem. Calico. refers

Opalate of potash, is consumed by calico printers in great
quantities. — it is found ready formed in the
of the wood-correl, in a state of superopalate

Sulphuret of arsenic is much used in calico printing, on acc^t
of its property of readily dissolving indigo. — ^{Parkes' Ch. Calico} Coppe-
& Realgar are both sulphurets of arsenic & are much
in calico printing & dyeing — Dr.

1

To make Blacking, Military
Book -

10 $\frac{1}{2}$ lb Bees Wax
9 — Ivory Black
3 — Soft Soap
3 — Yellow D.

25 $\frac{1}{2}$ — will make 30 Balls worth
1 $\frac{1}{2}$ each. —

The Bees Wax to be cut small & melted
seperately — both kinds of soap put in
together after the harder sort being cut
small — stir them whilst boiling
till melted — then take them off the
fire & put in the Ivory Black gradually
& stir them again — when done ~~then~~
empty it on the Table or board & when
cold enough to handle work it well
by the hand before it is formed into
the shape required & let them be kept 2 or 3
Days before they are used. —

To preserve Eggs

Put two pieces of quick lime ^{each} about the size of a brick - in a vessel - pour water upon them untill it is a thick kind of white wash; let it stand a night - & then add so much water to it as will still admit of an egg swimming with one end upwards to the surface - add two pounds of ^{common} Salt & ~~say~~ six ounces of cream of tartar - mix the whole together - this will be sufft. for 400 Eggs which should be put in fresh. —

(Miss Kirk's Receipt)

The cream of tartar is of no use in this

3

Powders for making stained Elect. Flowers

Vinegar - Salt Petre - powdered french berries & camphor
layers of it for yellow.

Red - powdered cochineal & Allum

Blue - Spanish Indigo powdered & Rock Allum.

All to be mixed with salt of Tartar - $\frac{1}{4}$ of the latter.

ment. as ^{being} probable - by Mr. Hymen
of London.

For the Rheumatism

1 oz Gum Guaiacum

$\frac{1}{2}$ oz Sal: Prunel - bruised together & infused in a
pint of rum for two days - to be taken a ^{Table} ~~small~~ spoon
full or two to be taken every night as occasion requires
after it has ~~been~~ been shaken in the Bottle & stood
to clear. -

Mrs. Jule

To take Ink spots out of Mahogany -

Spirits of Salts, or Muriatic acid which are the same -
diluted with water as occasion may require

Cement for Petrification works

To fasten with, on the turning Lathe.

Take common white rosin & one third of its weight of Bees wax - melt them together & when well stirred - pour the mixture into cold water - to make it a little cool so as to bear handling & drawing out - in the manner shoe makers wax is drawn - it will like wax become ~~become~~ much lighter coloured & tough. When made into rolls, it is ready for use. — This sort is used for fastening the diff. sorts of Petrifications & to the Lathe for turning. —

July 1806

Mr. Wm Hardy

Harder Cement For fastening petrification work together.

Make Cement as above ~~the~~ made tough by drawing out and melt it over again - add a little sifted Plaster of Paris to it - ~~the~~ after it is well mixed, pour it a second time into water & work it as before.

July 1806

W. W. Hardy

Some people put in Brick Dust instead of Plaster. Mr. Wm Hardy
Shell Sac is a good one - is a good cement where its colour suits -
White of Egg & Plaster of Paris is a stronger cement - but sets rather too quick in some
things before they can be properly adjusted.

Calif. Town. Thomas Washburn. ...
... of the ...
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6.
Dr. Hancliffe gave chemical lectures
at Matlock Sep^r 1806

The inflammable air that burns at the end of
the pipe for conveying light from a common
fire instead of ^{common} lamps. Dr. Hancliffe calls
carburetted hydrogen gas. He says the method
of letting ~~the~~ air pass over the surface of the
water in a cistern instead of being passing thro.
water is his own & that he has entered it
in the patent office. —

The smoke is condensed & becomes tar or petroleum. —

Phosphoret of lime

Take a glass tube with lime in it put both of them
into a fire, ^{when} till red hot put down bits of phosphorus.
these put into water will cause bubbles of fire —
This phosphoret of lime must be previously powdered. —

Or as Dr. Hancliffe has given the receipt
Take ^{the} phosphoret of lime, powder & throw it into water
which it instantly sets on fire. —
See another method Page 89.

27

The tincture of ~~of~~ litmus dropped in clear calybeate water produces starry appearances analogous to camphor. —

Dr. Handliffe

The farina of the lycopodium when in flower (being the dust of the common stag horned moss) ~~is~~ when poured over a glass of water — prevents the finger from being wet when immersed ~~to~~ in it — so that a shilling ^{or} ~~of~~ other substances can be taken out of the glass from the bottom of the glass without wetting the finger.

Dr. Handliffe

^{Gum benzoin}
Gum (benjamin) laid upon a hot stone & covered with a paper funnel — & the air stopped round it with sand — will form beautiful transparent crystals in the funnel. —

Dr. Handliffe

Fulminating mercury explodes with heat applied to it under a piece of paper - or if laid to a train of gunpowder will explode without the gunpowder taking fire -

Mr. Fanchiff

This preparation ~~has~~ might be advantageously employed in blasting rocks, as its explosive force is much greater than gunpowder, tho' it does not extend so far. It is said to have been discovered by Mr. Howard & is called Howard's fulminating powder. But was long the secret, and a privilege in France & Prussia.

Parthen. On 2^d Big. Exp. Note 1 + Page 34.

Dr. Hanciffe

Dr. Hancliffe says the following - may possibly
serve for mordants to the powders made for
electrical figures intended to be taken off upon
muslin in order to make the colours more
permanent. -

Acetate of lead (^{common} being sugar of lead) precipitated in extract
of weld or other ~~yellow~~ coloured extracts - when warm
at about 80 or 90 degrees or at the warmth of new milk

Oxemuriate of tin a mordant for scarlet
made thus -

~~2 Parts~~ 2 Parts muriatic acid (spirit of Salts)
1 Part Nitre
with tin dissolved -

Relief of Colours

Black is relieved by white

White by black

Red by green

Green by red

Blue by yellow

Yellow or gold by an azure.

Rose colour by an emerald green

Consult nature & mark by what antagonist colours she relieves herself.

To find a shade for any colour, or a proper contrasting colour, take a small round piece of glass of the colour you wish to have a shade from & look thro' it (when placed in a paper tube black in the inside) for some time at the sun or other bright object. Then taking the tube & glass with it from your eye & cast your eye upon a sheet of white paper. & the antagonist colour will appear. Thus the eye, after the pain of looking at so long thro' the coloured glass relieves itself when cast upon white paper. — See Page 19

Dr. Stancliffe

Luting for Vessels exposed to the
heat of strong fires. —

Take common Clay, Sand, & Lime mixed together
& moisten with water. — D^r Handliffe

<sup>say 4 parts sand
1 part clay
1 lb. lime</sup>
Gypsis furna is a very good lute for common purposes, but it is
necessary that the earthy be made very dry before it is mixed with
the linseed oil. — Linseed oil & sifted slaked lime,
well mixed, & made thorough & rightly plastic, form an excellent
coating for retorts: if made thicker, this mixture is an impenetrable
luting, that is not liable to crack. Parkes' Ch. Lab. vol. 23.

See Page of this work 18. & 102.

To calcine Tin

Put it into a crucible, when luted over, place
it in the fire, till calcined. —

W. Watson.

To obtain Oxygen —

The greatest quantity is procured from the
conferva fluviatilis found on stagnant pools —
but may be obtained from the green leaves
of all vegetables — this green matter is introduced
into a bottle full of water & inverted into a
glass of water.

The red rose is bleached by robbing it of oxygen — its colour
is replenished by adding oxygen. — Cotton &c is bleached by
adding oxygen. — The colour of the Negro, by the same
principle becomes white. D^r Handliffe

12. To stain muslin a yellow or buff colour, as made use of by the calico printers.

Is if electrical figures may not be fixed upon muslin by the same substances.

Aug. 31. 1807 - Tried the exp^t. ~~which~~ which did not answer with elect^y as a suff^t quantity could not be made to adhere to the glass.

Green Copperas dissolved in water, precipitated with Soda or pearl ashes - the water poured off & the precipitate dried & powdered for electrical figures - the muslin to be moistened in gum water & laid on the figure - then immediately dried that the colours may ~~not~~ not spread - afterwards put into lime water strong with pearl ashes. On the precipitate from Iron filings that have remained a few days in vinegar - when selected, & dried is a very certain stain or dye for moistened muslin &c.

W. Thos. Cantrell of Manchester

*
The above is a durable stain when laid on ~~the cotton~~ when moistened with water & laid on the cotton with a stamp or brush - but a suff^t quantity cannot be made to adhere to an electrical plate for printing.

13

Quills boiled in Allum water ~~for~~ ^{with} one
minute. will make them hard & transparent.

Book of thousands notable things

Bleaching - The New process - 1804

Salt 56^{lb}

Sulphur 10

Water 20

Manganese 20

Print. by an experienced
at Manchester. -

Ink made in Oct. 1806 - 2 Quarts

{Winchester measure

8^{oz} Nut Galls _____ cost - 1. 3

2^{oz} Green Copperas _____ - 1/2

1^{oz} Lump Sugar _____ - 1

4^{oz} Gum Arabic 2 3 _____ - 1

1^{oz} Common Prussian Blue - 1 - 3 1/4 or 1/8th Quart

2 Quarts of Water (made very warm)

The Galls were first well broken in a Mortar
then put in the 2 Quarts of warm water - these stood
till the next day & were frequently stirred. - When
& Sugar
'strained thro' a cloth the green Copperas was added after
pounding, & again stood untill the next day, after which
the Gum Arabic powdered, was then put into a small
quantity of the Ink, and set near the fire untill it

14
was completely dissolved, & then added to the whole. — The prussian blue was put in the last of all ^{which} ~~it~~ was previously ground with some of the ~~ink~~ ^{by} ~~was~~ with a Muller, & added soon after the Gumm. — Any of the ingredients might be put in ~~when~~ as soon as the preceding one was sufficiently dissolved. —

This is wrote with the Ink made as above, about half an hour after the prussian Blue was put in. — Without the prussian blue the ink was too brown a colour.

P B — **Bennet B**
1806

The above method of making Ink is from Rev. A. B. s. Memorandum except that the allum is here left out — And Prussian Blue added — as the ink made ~~at~~ that Receipt was found to be of too brown a colour. —

See another Method
Page 28 —

15

J. Whittham of Ashbourn sells Pale Oil
which he says is refined with ~~the~~^{an} alkaline Salt
(Salt of Tartar) — 48 Gallons — When thus refined
it will not corrode the spindle points nor swarf
so much as when prepared with oil of vitriol.

Novr. 1806

J. Raynes of Borsall says he was preparing
^{for killing rats}
a mixture of Salamoniac — 4 Drms

~~Cream of Tartar~~

~~8 — Corrosive Sublimate — 2 Drms~~

~~with Water — in an earthen pot in~~

~~which he had melted lead & pewter for making of
Spoons — in which a thin crust of this mixed metal
Metal was left round the edges of the pot attached
to the inside of the vessel. Whence above.~~

~~ingredients were set over the fire to boil (which
he did for some other purpose) He observed on pouring
off the liquor, that a globule of quicksilver was
formed at the bottom — which he put into a quill
to preserve — The Sublimate contains quicksilver, so that it
is collected together in the above process — See Nich. Chim. Dictionary
Under the Sublimate corrosive.~~

16

Solution of Copper in ^{nitrous acid} ~~aqua fortis~~

Nov: 1806- Thin shavings of copper put into a small earthen pot fixed in sand in a ladle to which when hot add aqua fortis of the best kind to dissolve the copper- keep it over the fire till it becomes hard which when powdered is a fine green- which preserve in bottles- a small quantity (a tea spoon full) of this powder when ^{well} mixed with ~~the~~ common water in a tea cup & afterwards poured upon a piece of tin foil ~~& immediately~~ & very quickly wrapped up- will generally explode & form calx in powder of the copper- & will sometimes set the tin foil on a blaze- The quantity of water should be so as to make it ^{almost into a} ~~into a~~ thick paste if much more is added it will not act.

Mr. Wright Druggist - Doncaster
 Nitrous acid is also mentioned in The Student No 2 Page 37
 Quere the 14.
 Copied in Page of this Book 58

Acid of Fluor

17

Nov. 1806 - When fluor spar (^{blue John}_{or Enfield Spar}) is powdered
& ^{mixed with} a little oil of Nitric will corrode glass;
if previously prepared with bees wax ~~figures~~
may be made upon it, as is done upon copper when
aquafortis is used by the engravers. - By this means
Letters or Landscapes may be made upon glass
by the acid that is contained in the fluor spar
which is said to be the only substance ~~that~~
from which it can be produced - It was discovered
^{some} ~~about two~~ years ago from observing that the
glass bottles in which the acid was extracted,
were deprived of their polish in the inside.

Mr. Wright Doncaster

~~By this means the~~
The fluoric acid gas applied to the glass will make opaque figures -
~~By this means the glass in windows may be marked~~
~~in stripes & circles as blinds instead of the vegetation~~
~~shades which prevent much light from~~
~~will not answer for blinds being too transparent.~~
Grinding glass in stripes with emery answers better.

18 Grinding of Glap

Glap may have its polish taken off the ^{very, regularly} surface by rubbing it with ^{water &} a sand stone ² that is free from flinty particles - a good sort is found in a quarry at Brelsford near Derby. — W. Peal
If the stone has flint in it, the scratches will be too deep. —

The polish may be still more finely took off by flour of emery rubbed on the glap by a piece of lead, into which the emery penetrates & is ^{thereby} held fast. ~~which the~~
~~glap is rubbed with it.~~ — Water is also mixed with the emery. — Atkinson ment. this W. Peal —

Glazes (see also page 11. & 102)

Mr. Watts' fire lute — Porcelain clay from Cornwall (not pipe clay) powdered small & mixed up to the consistence of thick paint, with a solution of two ounces of borax in a pint of water. For want of this clay, white lime may be used in its stead. This may be kept in ready mixed in a covered vessel. For cold lutes take equal parts of the above clay & wheat flour mix with cold water. This is more tenacious than the fire lute, but will not keep long. Whites & yolk of egg, with half its weight of quick lime in powder, applied on linen. —

Relief of Colours see also Page 10

Yellow, with black - or blue or red
 Blue - with yellow - white -
 Green - with white -
 Red - with yellow - white - black
 Gold - on blue - black - white - scarlet.

The Book of (Printed by Swindell, parished the new handmaid to Arts & Sciences &c
 J. G. Chaffons no date 3 sold by J. Rogers & J. Sadler, Manchester.
 The book from which the above is taken mentions other colours which as
 reliefs - but being erroneous are not here inserted.

Colours

To resemble new Oak - Umber & White lead -
 Do. Grap Green - Verdigrise & pink
 Do. Brick colour - Red lead, white, & yellow-oker.
 Do. Walnut - Burnt Umber & white.

Do.

Staining of Wood

To stain wood black - boil logwood in water or vinegar
 & two or three times brush the wood with it whilst
 hot; then rub on decoction of Galls & Copperas or if
 possible steep the wood in the hot liquor.

Do.

To dye Cotton ^{red} with Madder — To 12^{lb} Cotton

6 Gal: Water — 4^{lb} Alum — 4^{lb} best pearl Ashes
mix the two together; put in the Cotton to lie
24 hours — then take it out & wash it in cold water.
put it into a Copper — & mix in the madder —
light the fire under the boiler & let the liquor
boil an hour — then take the Cotton out &
dry it. — D.

Orange on Cotton — 1^{lb} Cotton or Silk — 1^{oz}
Arnato, & 2^{oz} of the best pearl-ashes — boil these
well together — put in the Cotton & boil it 10 minutes.
D.

Black on Cotton — 21^{lb} in Hanks —

Take two pounds of ~~ex~~ verdigrease,
2^{oz} of Copperas, 10^{lb} of Logwood, 3^{oz} Alkaline Salts,
2^{oz} oil of Vitriol, mix them together & put in the
Cotton, boil for 3 hours — then cool it — then
boil it again 1 hour in the above liquor — take
it out & wash it well — then take 1^{lb} Galipot
oil & 1^{lb} spanish whitening ^{residue} mixed together — & put in
the Cotton for 12 hours, when washed, it is finished. — D.

21

Let A buy each thing

De

To take out oil or grease

Burnt Bone & Fullers earth mixed with white wine.

To take out fruit Stains from Linen Cloth

Rub on a little butter, & let the Cloth lie in scalding hot milk awhile; when a little cooled rub the stained part with the milk. — then with soap & water. — D.

2.

Dead White paint,

Is made from the common white lead as sold ready ground with ^{thin} linseed oil, at the shops in a thick state, with which a quantity of paris whiting is to be mixed & re-ground together with Spirit of ^{Turpentine} ~~Turpentine~~. ~~Apply with~~ no additional linseed oil, or very little to give it, prevents its setting off the wood when dry.

To dye Blue with a cold Vat.

- | | |
|---------------------------|------------------|
| 1 lb Indigo finely ground | } mixed together |
| 2 lb Copperas | |
| 3 lb Unslaked lime | |
- Water 2^d. how much

When cotton is dipped in the above two or three times - it is put into a vessel in which oil of vitriol are ~~and~~ water are mixed together untill the mixture tastes very sour with the vitriol. The cotton is after this taken out & rinsed in a ~~running~~ stream of water. —

Nov. 1806 — J. Raynes
Norwalk

very common
Decoction of the seeds of the very common plant *Capsia tora* of Linnaeus, which is exceedingly mucilaginous, is used by the dyers of cotton cloth blue to help to prepare the blue vat. It suspends the indigo till a fermentation takes place to dissolve it & also helps to bring about that fermentation earlier than it otherwise would. — *Philas. Transac.ⁿ Vol 81 Part 2^d Page 234ⁿ*

Amalgam of quicksilver & zinc is made the best by the usual method of pouring the quick silver upon the melted zinc — but it becomes much better more fit for use when it is afterwards ground in a mortar. — The annexed method which is now erased did not ~~near~~ answer ~~half~~ so well. —
use $\frac{3}{4}$ lb quick silver
 $\frac{1}{4}$ lb zinc — See B's elect. memorandums —

23

~~Amalgam of quicksilver & zinc for exciting the elect. Machine.~~

~~Take quicksilver & about one fourth part
of its weight of zinc - put them together in
a ladle or pot - with a little water which
prevents the quicksilver from flying out by the
heat untill it gradually incorporates itself
with the zinc let the ladle remain on the
fire untill the water is entirely evaporated
& in a short time after the zinc will be
completely melted - which may be known
by probing with a small stick or iron
pin - ^{when} ~~if it is~~ melted, the amalgam is completed
by working it in the hand with the fingers. -~~

~~The method of making this Amalgam in water was first done
by B. Nov. 21. 1806 - The usual method was to melt the
zinc & to pour the quicksilver upon it, ^{without using water} ~~taking care~~ thro' a hole
in a board with which the ladle, containing the melted zinc, was
covered. -~~

~~April 1807 - Made Amalgam by putting in the quicksilver in
boiling water & having melted a proper proportion of zinc it
was poured into the hot water at the bottom of which it
incorporated with the quicksilver, better than in the former method.~~

To dye Blue with a cold Vat.

- | | |
|--------------------------------------|------------------|
| 1 ^{lb} Indigo finely ground | } mixed together |
| 2 ^{lb} Copperas | |
| 3 ^{lb} Unslaked Lime | |
- Water 24. how much

When cotton is dipped in the above two or three times - it is put into a vessel in which oil of vitriol and water are mixed together untill the mixture tastes very sour with the vitriol. The cotton is after this taken out & rinsed in a running stream of water. —

Nov. 1806 — F. Raynes
Barnall

^{very common}
Decoction of the seeds of the very common plant (*Eupia tora* of Linnaeus) which is exceedingly mucilaginous, is used by the dyers of cotton cloth blue, to help to prepare the blue vat. It suspends the indigo till a fermentation takes place to dissolve it & also helps to bring about that fermentation earlier than it otherwise would. — Phil. Trans. Vol. 81 Part 2^d Page 234.

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use $\frac{3}{4}$ Quick Silver
 $\frac{1}{4}$ Zinc

See B's eluc. memorandums

23

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with the zinc let the ladle remain on the
fire until the water is entirely evaporated
& in a short time after the zinc will be
completely melted - which may be known
by probing with a small stick or iron rod
when it is melted, the amalgam is complete
by working it in the hand with the fingers.~~

~~The method of making this Amalgam in water was first done
by B. Nov. 21. 1806 - The usual method was to melt the
zinc & to pour the quicksilver upon it ^{without using water} ~~taking care~~ thro' a hole
in a board with which the ladle, containing the melted zinc, was
covered.~~

April 1807 - Made Amalgam by putting in the quicksilver in
spilin water & having melted a proper proportion of zinc it
was poured into the hot water at the bottom of which it
incorporated with the quicksilver, better than in the former method.

24

Ramifications ^{earthen plates} white ones on common

When lamp = ~~black~~ or ~~the~~ burnt
~~veg~~ vegetables were ground upon
 a common white plate pretty fine -

a little water was dropped upon the
 ground substance whilst moist - which
 caused it ~~to appear~~ white ramifications,

by driving the ground substance from
 the white surface of the plate -

When Nitric Acid was applied instead
 of the drop of water - the ramifications
 appeared almost instantaneously & ~~more~~
 were more perfect. Nov. 22. 1806 - J. D.

Dyeing Brazil red on Cotton.

25.

For 12^{lb} Cotton ^{in hanks} - take 2^{lb} Allum } mixed
2^{lb} Ashes }

put in the Cotton 24 Hours - then wash it -
afterwards put it into 12 Gal: Water

Half bat { 1^{lb} Brazil Wood
1^{lb} Peach Wood
1 Gal: Urine
4^{oz} Pearl Ashes

The new hand made

Dyeing Nankeen cloth

1^{lb} Ashes in as much water as will wet 24 yd^{of} Cloth
1^{lb} Copper in the same quantity of water
dip or wash the Cloth in each alternately till
a buff green - then put the Cloth in cold
water till it comes to the right colour
which will be in an hour or two.

The nankeen colour is the same by addg. a little sugar
of lead to the Ashes. —

Dr.

26

To make Paper transparent.

Stretch paper on a frame - take

2 parts of Nut or linseed oil

2 parts Water

white Glap beaten to a fine powder

boil them in a sand Bath till the

water is evaporated mix & strain it - &

lay it ^{thinly} on the paper with a brush.

De.

Gilding on Wood.

The Soze - Take cuttings of parchment, boil it in water to a jelly in an earthen pot - strain, & let it cool. When it is to be used make it hot & put in as much ~~more~~ ^{fine} whitening into it as will give it a colour & mix it well with a brush. - With this mixture brush over the wood. when dry - repeat it again with the brush adding a little more whitening - in this

manner proceed seven or eight times — cut out^{2d}
the size with a small gouge in the carved
parts that are clogged up & smooth them off with
a wet rag — & rub it smooth when dry.

Then take an equal quantity of french &
english bole ammoniac, ground fine in water
~~the~~ scrape into it a little tallow & grind
them well together, with these mix a
little quantity of the parchment size with
a double proportion of water. — Lay this
last size on the wood when blood warm
two or three times — except where the carving is deep.
as a yellow colour must ^{there} supply the place of gilding.
Lay on the gold leaf with a camel hair pencil
& press it down with cotton — previous to
this the size is moistened on the wood.

— Let the work stand till the next day to dry.
Then with a wolfs tooth burnish the leaf gold
on the wood. Or with pebbles of a proper shape.
Colour the cavities with ~~laker~~ laker. saffron &
dragon's blood. or the colour called ornator.

De.

Ink

see also Page 13 for another method

8. 7. Aleppo Galls, in coarse powder

4 oz Logwood, in thin chips

4 oz Vitriol of Iron

3 oz Gum Arabic, in powder

1 oz. Sugar Candy

12 ^{lb} or Water

Boil the galls & logwood in the water together for an hour, or till half the $\frac{3}{4}$ liquid has evaporated. Strain out the decoction thro' an hair sieve, & then add the other ingredients. Stir the mixture till the whole is dissolved. Then decant the ink, & preserve it in bottles well corked.

This page was written with the ink made as Page 13 — as well as the $\frac{1}{2}$ preceding leaves of this book. — which looks rather pale at first, but becomes deeper coloured in a few hours.

M. Ribaucourt

See Rich. ^{En's} Chim. Dicty. to p. 10. Lewis

M. Ribaucourt adds vitriol of copper, but this ^{to p. 10. Lewis} was found an objection — by Dr. Lewis, on account of its corroding the edges of penknives. ~~which the ink~~

Oil-colour Cakes

29

W. Blackman's Method (London)

Take Gum mastic in fine powder ——— 4. ^{oz}

Spirit of Turpentine ———— pint

Mix them in a bottle, stirring them frequently till the mastic is dissolved. — If wanted in haste heat may be applied — but the solution is better without. — Let the colours which

are made use of be washed — till very fine. —

When dry grind them on a hard close stone

(porphyry is the best) in spirit of turpentine adding a small quantity of the mastic varnish.

Then let them dry — Procure of some of the

purest ^{spermaceti} ~~the~~ melt it over a gentle fire in a clean earthen

vepel; when fluid add to it one-third of its weight of pure poppy oil, & stir the whole well together. These

things being in readiness, place the stone, on which

your colours were ground, on a frame or support, &

by means of a charcoal fire under it, make the stone

warm; next grind your colour fine with a muller,

then adding a sufft quantity of the mixture of poppy

30
oil & spermaceti; work the whole together with
a muller to a proper consistence. Take a piece of
a proper size for the cake you intend to make, roll
it into a ball, put it into a mould, press it, & it
will be complete. —

When these cakes are to be used they must be
rubbed down in poppy oil or other oil, or in a
mixture of spirit of turpentine & oil, as may best
suit the convenience & intention of the artist.

N.B. — It may be proper to observe that Mr. Blackman's
colours in bladders differ from his cakes in having only
a larger proportion of oil. —

The Student
N. S. —

White — (For painting &c.)

Let pure zinc be dissolved in diluted vitriolic acid,
into the solution pour gently a solution of tartar
in water, & the metal will be precipitated in
the form of a white powder. Let this pre-
cipitate be well washed in pure water &
dried, & it is then fit for use. — This white

will work either in oil or water.

31

Recommended by the Academy of Dijon. *Recept N^o. 1*
Chaque. white paint is made in the common way from the
thick white lead sold in the shops, mixed with whitening and oil of
turpentine instead of using much linseed oil. — W. Watson.

Naples Yellow

Take 12^{oz} White Lead

3^{oz} Diaphoretic Antimony

1^{oz} Allum

1^{oz} Sal-ammoniac

Grind these together upon a levigating stone;
then put the mixture into an open crucible
to be exposed to a gentle fire for some hours;
the fire is afterwards to be increased during a
certain time, & finally the mixture is to continue
three hours in a degree of heat, sufficiently
to keep the crucible red hot. The mass will
then be found to have acquired a beautiful
yellow colour. If it be wished to be more of
the colour of gold, a greater quantity of
diaphoretic antimony & sal-ammoniac must be
added to the other ingredients. — *Recept N^o. 1*
This is probable the grey calx of antimony might be used instead of
diaphoretic antimony,

Burnished gilding on Glass

(For borders of Prints or Drawings) (Or ^{For} some Plates)1st Method

Dissolve some of the whitest & most transparent isinglass in the cleanest water, till pretty thick, strain it thro' a linen cloth, & keep it in a phial well corked for use. When you intend to gild take from the phial, about the size of a pea of the isinglass jelly, & put it into a tea cup containing some clean hot water, in which it must be dissolved. Next prepare your gold leaf by cutting it on a gilding cushion, into such convenient forms & sizes as may best suit your work. With a hair pencil, dipped in the isinglass water, touch those parts of the glass which you would have gilt; & while moist lay on the gold leaf ~~leaf~~ leaf gold. Hold the glass in a slanting position within the warmth of a fire, & the work will be dry in a few minutes. While it is a little warm,

with a piece of clean cotton cloth wool, rub the gold on the glass smartly, till the parts gilt receive a kind of polish; then proceed to lay on a second coat of gold, & drying & polishing it as before; & in the same manner a third coat, which will be fully sufficient. —

If it be necessary to have a straight sharp edge, — with a thin flat ruler & a pointed piece of ivory or a needle, draw a line out of the gold, & with a mahogany or Deal stick, cautiously pointed to a proper breadth, work away the superfluous part. If a ground be necessary, let the proper colour be well ground in spirit varnish, & brushed over the parts required. —

2nd Method.

This has been considered as a great secret, & is much superior to the preceding method of gilding.

Take the best black japan varnish, ^{perhaps Pontepole varnish} such as is used for the roofs of carriages, to which add a small quantity of burned lamp-black, well ground in spirits of turpentine, & with a large flat varnish brush, give the glass one even thin coat.

preparing a small degree of transparency, and
 appearing a good black at the other side of
 the glass. Let your letters or ornaments be
 drawn on paper, the back of which must be
 rubbed with red chalk, & a little fresh butter,
 then transfer the outlines to the varnished ~~part~~
 side of the glass by tracing, & with a fine needle,
 fixed in a wooden handle, scribe the outlines of
 what black is to come out through the ~~varn~~
 varnish, so that not an edge may hang to the
 main body of the black. Spread a little water
 over the parts of the varnish you wish to
 detach from the glass; & in a few minutes,
 by raising one edge of the black, it will all
 peel off away from the glass as if it had never
 been on it. When all the black to be
 taken off is removed, bring the glass to the fire,
 & the remaining varnish will soon become as
 hard as ever, & the open parts may be gilt by
 means of the isinglass water, as in the former
 method.

N.B. Twice gilding, if well
 executed will be sufficient in this method.

Student.

Oil-Varnishes

Copal

Take finely powdered copal	4 Parts	
Oil of spike-lavender	4 "	} by weight
Oil of turpentine	1 "	

Put them in a bottle & expose them to a gentle heat for half an hour, frequently stirring these ingredients, - & the whole will be dissolved into a thick varnish, which may be brought to a proper consistence by adding hot oil of turpentine.

Student N^o. 2

Or take oil of spike-lavender & dissolve in it by means of heat, as much copal as it can take up, & then it afterwards by adding hot oil of turpentine.

N.B. After adding the hot oil of turpentine more copal may be dissolved in it by means of heat. Let the varnish settle & pour off the clear part for use.

Do.

Other varnishes cont. over.

36

Oil Varnishes - (continued)

Take oil of turpentine ————— 3 Parts
 Mastic ————— 1 —
 Canada balsam ————— $\frac{1}{8}$..

Dissolve with a gentle heat & strain off for use

Take oil of turpentine ————— 4 Parts
 Sandarac ————— 2
 Mastic ————— 2
 Canada balsam ————— $\frac{1}{2}$

Dissolve in a gentle heat & strain off for use.

Spirit Varnishes

Take highly rectified spirit of wine ————— 8 Parts
 Mastic ————— 5 —
 Canada balsam ————— $\frac{1}{2}$

Dissolve by a gentle heat & strain off for use.

Take highly rectified spirit of wine ————— 8 Parts
 Mastic ————— 3 —
 Sandarac ————— 3
 Canada balsam ————— $\frac{1}{4}$

Dissolve &c as above

Spirit Varnishes continued

37

Take highly rectified sp. of wine — 12 Parts
 Copal — 8
 Chio turpentine — 1
 Oil of spike-lavender — 2
 Dissolve with heat & strain off for use. —

Take highly rectified sp. of wine — 12
 Copal — 8
 Chio turpentine — 1
 Canada balsam — $\frac{1}{2}$

First put into your ^{bottle} ~~best~~ the turpentine & balsam, with about a quarter of the copal & spirit of wine; set the bottle in a sauce-pan, nearly full of cold water, over the fire till the whole is dissolved; add by degrees the remainder of the copal & spirit made hot, shaking the bottle well after every addition. When the ingredients are well incorporated, take the bottle out of the boiling water, & when it has stood a few days to settle, the clear part will be fit for use. This is perhaps one of the best varnishes for pictures ever communicated to the public.

turnover

Note. The solid gums, in the preceding receipts, must be reduced to a powder before they are put into the oil or spirit. If the solution prove too thick more of the solution oil or spirit must be added; if too thin I add more of the solid ingredients. All the parts are to be taken by weight.

A ^{copal} Varnish is also mentioned for Coaches &c. in the Student No. 2. Which see copied in this book page 59

Etching (a new method)

Take a copper plate, finely polished & of a proper size; over which lay a thin even ground composed of the common etching ground, softened by the addition of a small quantity of sweet oil. On this ground lay a piece of silk paper to which the drawing intended to be etched has been previously transferred. Let the paper be secured at the four corners by wax. Then with a pen nicely pointed, but without a cleft, proceed to trace over every part of the drawing taking care that the pressure be every where in proportion to the strength of the intended lines.

39

The paper being carefully removed, a border of rosin tempered with tallow must be securely fastened round the plate, forming a spout at one corner: pour on the aquafortis, (the strength of which ought to be previously ascertained) which must be so weak as to require two hours & a half to produce the desired effect. After the plate is sufficiently bitten, the border removed, the plate washed in water & cleaned, it will be ready for working off. —

Student No. 2

Aquatinting —

Of preparing the ground. — Take of burgundy pitch, which has been gently boiled in an earthen pipkin for half an hour; break it into small pieces, & put them into a phial containing some rectified spirit of wine. Make a strong solution, & when it is well settled, carefully decant the clear part, & keep it in a bottle well stopp'd for use. Have also

ready a phial containing some pure spirit of wine, that you may suffer no inconvenience in adjusting your ground to the coarseness or fineness you ^{may} want; for these depend on the strength of the solution, & on the length of time it remains upon the plate.

This ground improves with age.

Of laying on the ground.

Having made your plate perfectly clean, surround it with a border of wax, having a spout at one corner, warm the plate a little, place it on a level table, pour on the fluid ground with a steady hand upon the corner opposite the spout. After standing a minute pour it off as quickly as possible; strip off the border of wax from the part from which the fluid runs, to prevent what remains on that part from returning upon the plate & still to prevent it more effectually, wipe away the redundant fluid from that part with a rag. Should your ground fail, & there be need of

49

laying on another, the defective ground may be removed by spirit of wine. —

Of raising the touches or shades.

Take three parts of washed whiting, one part of lamp black, grind them together with bread & water till the mixture be of a proper consistence to be used with a camel hair pencil. Where any shade is intended, the part must be covered with this preparation, & when nearly dry, float over the whole with turpentine varnish (made by dissolving asphaltum one part in oil of turpentine three parts). After this is dry, lay the plate in water till the touches rise. If they do not rise as quickly as you desire, a little aquafortis may be added to make them. The plate must then be carefully washed & dried. —

On biting. — Reduce your aquafortis to a proper strength by adding water, and ascertain by experiment what time it will take to bite deep

42
enough for the lightest shades. Lay your plate
quite even & pour on the prepared aquafortis, &
when it has bit deep enough for the lightest
shade, pour it off, wash the plate with clean
water, & when dry you may proceed to stopping out.

Of Stopping out. With a pencil dippe
in the turpentine varnish mentioned above,
proceed to cover those parts where the lightest
shades are to appear. When this is dry, again
pour on the prepared aquafortis, & let it remain
the same time as before. Then pour it off,
wash & dry the plate, stop out the next degree
of shade, & proceed as before till you have produced
the darkest shades. If the work has been performed
as it ought, an impression from the plate will
possess all the softness & freedom of the original
drawing. The above receipt was purchased from
an eminent Artist in London, & cost five guineas.

Student No. 2

Blue & Green Verditer

43

In the Encyclop: Brit: under the article Chemistry, Page 474, it is observed, that "there are two kinds of verditer, the blue & the green. The green blue is by far the brighter colour, & consequently the more valuable. It has been said that this has been obtained by precipitating a solution of copper by any calcareous earth; & therefore is sold by the refiners, who have large quantities of the solution of copper (in aquafortis) accidentally made. The solution is said to be precipitated by chalk, or whiting; & that the precipitate is the beautiful blue colour, called verditer. By this method, however, only the green can be obtained."

If the gentleman who wrote the above had added a little more calcareous earth than was necessary for precipitating the precipitation of the salt, he would have seen that the green converted into the true blue verditer; & in this alone lies all the mystery.

(Turnover)

Student
No. 2

Green Verditer

Into a clear solution of copper in aqua fortis, pour gradually a clear solution of salt of tartar in water till no more calx precipitates. When well settled pour off the liquid, wash well the sediment in water, & dry it for use.

Student
N. 2.

Blue Verditer

Precipitate the calx as before, then Triturate with as much salt of tartar as will change it to a fine blue. Then wash it in water & dry it for use. These verditers will be of a brighter colour than those sold in the shops.

It appears from the above that the green verditer differs from the blue in an acid prevailing in the former, & an alkali in the latter. Hence also, for common purposes, quicklime or chalk may be substituted for the salt of tartar in the above preparations.

Non Libi. In the Student N. 2

Red Port-Wine made to rise in water

If a decanter full of water, with the mouth closed with a bit of paper, be inverted, & the mouth held a little below the surface, in a glass of port wine; as soon as the paper is withdrawn from the mouth of the decanter, the wine will be seen ascending to the top of the decanter like a red smoke, & the water descending into the glass.

(The wine being as 99 to 100 of water ~~the~~ it rises in consequence of being ~~light~~ ^{much lighter} ~~than~~ ^{than} water.)

Student.

The silver tree, or arbor Diana.

In this beautiful experiment, the iron or copper has a more powerful attraction for the nitrous acid than the silver; in consequence of which the iron or copper is dissolved, & the silver precipitated; but, as the process goes on slowly, the precipitated silver has time to assume a supererical arrangement according to the law of its crystallization. The silver is precipitated in its metallic

46

form, because the pure air, which would have combined with the silver to constitute a calx, is required by the precipitant as it combines with the acid. The intermediate cause of the peculiar arrangement of the particles of the precipitated metal is still, I believe, concealed in the grand repository of nature's arcana.

(Student No. 2

Mr. J. Lane of Rochdale's explanation
of the cause of the figure called

The Silver Tree, or arbor Diana. See ^{next page}

~~Make Mistake~~ Take a decanter full of water, with the mouth closed with a bit of paper, & inverted then the mouth held a little below the surface, in a glass of port wine; as soon as the paper is withdrawn from the mouth of the decanter, the wine will be seen ascending to the top of the decanter like a red smoke, & the water descending into the glass.

Student No. 1.

The silver tree, or arbor Diana

If a few leaves of the silver, such as are sold in books, be dissolved in twenty or thirty drops of aquafortis, some of the solution spread upon an even glass, & a bit of iron or copper placed at ~~one~~ one corner, immediately will be seen to shoot forth a silver tree, spreading its shining branches as far as the solution extends. —

(By Non Sibi) Student No. 1

Preparation for a smelling bottle.

In a small phial put 2^{oz} of dry sal ammoniac reduced to a coarse powder, to which add one part of dry salt of tartar. Cork the phial, shake the salts well together, & you will have a very useful smelling bottle. — Neither of the ingredients have any smell before they are mixed. —

(By Non Sibi) — Student No. 1

Motion occasioned by impregnating substances with odorant liquors.

Small pieces of cork or paper impregnated with an odorant liquor (as a spirit of turpentine) & wiped, ^{most probably} placed on the surface of water, are immediately moved by a very swift notation.

Student N^o. 1

^{The method of making}
 Lock crystals formed by the liquor of flint is mentioned in the Student N^o. 1

A powder for lightening candles

Fill half or two thirds of the head of a tobacco pipe, with a mixture of calcined alum two parts, charcoal & salt of tartar, each one part, all reduced to a fine powder. Let this mixture be slightly pressed down, & the remainder of the head filled with fine sand. Let the head of the pipe be gradually heated till the blue flame has ~~ceased~~ ceased to play on the surface of the sand;

49

after which, give it a red heat for twenty five minutes. When the matter is cold it may be put into a phial, corked, & kept for use.

It is necessary to light a match or a candle, a little of the powder may be ~~powere~~ poured upon a cold stone or upon brown paper, which will immediately take fire.

(By Don Libi)

Student No. 1

Sympathetic Ink

Dissolve pure cobalt in nitrous acid - mix the solution with 3 or 4 times its quantity of water & a little common salt. - When written with & heated it becomes a beautiful green colour on the paper, which ~~disappears~~ disappears again ~~if~~ when cold - if not at first make too hot. -

Student No. 1

Ice

Let a thin glass tube, three inches long & three-tenths of an inch in diam^r, be nearly filled with water; & at short intervals, repeatedly dipped into good vitriolic ether, & the water in the tube will soon be converted into ice.

~~How is this effected & how ordinary?~~ See also Page 58. Student No. 1

To Dissolve Quicksilver

If quicksilver be dissolved in aquafortis, & the solution diluted, it appears as clear as water. If a clean halfpenny be put into this solution, & then washed in clean water, it appears converted into silver.

There is one state of the solution in which the experiment will not succeed.

Corrosive sublimate dissolved in water - does the same.

Student No. 1

Toinglap Glue

Take an ounce of isinglap, pound it in a mortar, pick it into small pieces, & put the whole into a half pint phial & fill it with common gin, put a cork into the phial with a notch cut in one side

off it that the vapour may escape, place it near the fire, & shake it often till the singlasp is dissolved. Strain off the whole & keep it in a clean phial well corked for use. This glue will be good many years, & by warming becomes fluid & fit for use.

Student No. 2

Of taking impressions from Medals.

Clean well the medal from which you intend to take an impression, place it level, & having melted the above glue, pour as much of it ~~on~~ upon the medal as will cover it without running off. Let it stand to dry, which in warm weather will be in one day. The impression may be ~~be~~ taken from the medal by putting a penknife under one side of it, which will prove a clear, transparent & perfect resemblance of the medal from which it was taken.

The medallie impressions may be made of any colour; yellow with saffron, green with verdigrease, crimson with cochineal &c. If a piece of leaf gold be laid

upon the medal, some of the glue poured upon it, & that, as soon as cold covered with gold leaf, the impression, when dry, will appear to be solid gold. — By which ^{method}, a person appeared to cut off a thin slice from a Guinea. —

A good isinglass cement. Student No. 2

Take equal parts of the above glue & good drying oil, & the mixture will prove a good cement for earthenware, china, glass &c. or for gluing any thing that must be exposed to the weather. The articles ~~so~~ cemented should be baked in an oven.

Student No. 2
Slate paper. — Take two parts of boiling water & one of the ~~above~~ glue made of isinglass, mix them well with fine emery & lamp black, & lay on two or three coats of this mixture upon stiff paper with a brush.

Student No. 2

Court plaster. If two or three coats of the isinglass glue, mixed with a little honey, be spread upon thin black silk, it will form an elegant plaster for covering slight wounds. —

Student No. 2

To fine beer, wine &c. —

In one quart of state beer dissolve half an ounce of isinglass. Three spoonfuls of this solution put to every gallon of ~~this solution~~ turbid ale or beer, & the mixture shaken, will be sufficient to fine it. To clarify wine, dissolve the isinglass in wine & proceed as before. Time must be given for the isinglass to sink to the bottom. —

Student No. 2

To prepare fixed nitre, or white flux.

Nitre is a neutral salt composed of nitrous acid & vegetable alkali; cream of tartar is a compound of the acid of tartar & vegetable alkali;

It is well known, that both these acids are destructible by fire. Wherefore, when a mixture of nitre & cream of tartar is burned, the salts are decomposed, & the acids destroyed, & consequently the residuum is the vegetable alkali, which ought to be kept ~~for use~~ in a phial & well corked for use. The uses of vegetable alkali are ~~ex~~ exceedingly numerous in chemistry, medicine, manufactures, & the arts.

(By Bondi) Student No. 2

To exhaust a bottle of its air

(Without an air pump)

In the neck of a Florence flask, containing some drops of water, cement a good cork; cover the top of it with sealing wax, & with a hot-knitting-knittle bore a hole through the middle of it, over the hole fix a valve of wet bladder, place

the flask on a moderate fire, & observe, ⁵⁵the
moment the water & vapour disappear, to
close the valve & afterwards to secure it
with cement. Thus a vacuum is prepared
for many curious experiments in electricity.

(By Hon. Libi) L'Acident N. 2

Coating for electrical bottles

First smear over the inside of the bottle with stiff
paste, put into it a quantity of brap filings, &
turn the bottle so that the filings may adhere
to every part, & the bottle is coated.

2nd Method - Cover the inside of the bottle
with ^{very} stiff paste, take a piece of tin foil of a
proper size, roll it round a twig, & put it
into the bottle, press the edge of the foil
to the paste, unroll it, & press it to every part
with a pen &c.

3rd Method - Take Bismuth 2 parts,
lead & tin each one part, melt them together
& carefully ~~over~~ ^{skim} off the drop, remove

36
The mixture from the fire, & before it grows cold add ten parts of hot mercury, stir the whole well together, & the amalgam when cold is fit for use. Let the bottle to be coated be quite new & clean; put into it a sufficient quantity of the amalgam, incline the bottle, & gently turn it round, that the composition may adhere to every part, pour out the superfluous amalgam, & the bottle will be beautifully coated.

Glass globes, concave & convex speculums, & perhaps common looking glasses, may be silvered with the above amalgam or composition.

Student N^o. 2

To dissolve sealing wax

Pound it in a mortar & mix it with turpentine

Student N^o. 2

Under the description
of an elect^l. machine. —

Pounded sealing wax is soon dissolved with spirits of wine. —

An optical Deception

57

If a shilling be put into a large conical
drinking glass, more than half filled with water,
a plate placed on the top of it, & the whole
inverted quickly, you will then see on
the plate a piece of money of the size
of a half crown, & higher up another piece
of the size of a shilling. ~~What is the cause~~
~~of this optical deception~~ — Student No 2

Yellow

A solution of fixed nitre in water added to
a solution of corrosive sublimate in the same
fluid — produces a beautiful bright yellow
precipitate. — (By Libi) — Student No 2
Chemical Queries Page 36

To take off the white film on the Eye.

The juice expressed from the galls of fishes is said to
be a certain solvent of the white film which causes
blindness. — Student Page 37
No. 2

The Oil of burnt rags or paper — is said to do the same
procured by burning them between two plates Wilcockson

Copper dissolved in nitrous acid
and wrapped in tin foil taking fire. —

Being the same experiment as ment. Page 16. —

If the crystals, formed by of the saline combination of copper with the nitrous acid, be properly powdered, maintained, & rolled up in tin foil, the salt deliquesces, nitrous fumes are emitted, the mass becomes hot, & suddenly takes fire.

Student N^o 2 Page 37

Freezing (Cream &c in summer)

The solution of equal parts of nitre & of sal ammoniac sink the thermometer 36 degrees; diluted vitriolic acid & Glauber's salt 45 degrees; nitrous ammoniac, during its solution, — 48 degrees; a mixture of Glauber's salt & diluted nitrous acid sunk the thermometer ~~to~~ 60 degrees. Hence it is easy to freeze water, cream &c. on the hottest day in summer. —

See also Page 50.

Student N^o 1 Page 28

Hard copal varnish for Coaches &c. ⁵⁹

- Of the melting pot - Let a copper vessel be made of a proper size, the height of which must be twice its breadth at the bottom, & the top diam^r something less than the bottom. The vessel should also be fitted with a cover.

Of the Drying Oil. To prepare a drying oil proper for making the hard copal varnish for varnishing coaches &c & which is not liable to crack. Take white vitriol, blue vitriol, lapis tutia, & lapis calaminaris, of each two ounces. The vitriols must be reduced to a coarse powder, & exposed to a degree of heat sufft. to expel all their moisture. Then put one gallon of linseed oil & the five powders into the melting pan pot & boil the whole gently for two hours, taking care to stir it all the time.

Of the copal varnish - Take one pound of copal grossly powdered, put it into the melting pot,

which place over a good charcoal fire till it melts & rises nearly to the top of the vessel. Then take two quarts of the prepared drying oil boiling hot, & pour it gradually into the melted copal, stirring it all the time of pouring. The moment you begin to pour the boiling hot oil into the melting pot, another person must be ready with a pair of bellows to blow the charcoal fire, & which he must continue to do till all the oil be poured in. The varnish must then be kept boiling till a drop put upon glass appear brown & transparent. This varnish must be brought to a proper consistence for working by adding hot oil of turpentine. When the varnish has done settling pour off the clear part for use. This varnish will dry in ten or twelve hours. —

Student No. 2 - Page 11

Silver is dissolved by a mixture
of nitre & oil of vitriol. which does
not affect copper, iron, lead, regulus of cobalt,
gold & platinum. —

Heir / See Nicholson's
Chem. Dicty. under silver.
Page 827. —

To prepare Cotton for Dyeing
Boil it in a solution of alkaline salts
& afterwards expose it to the suns rays,
in the ^{bleach} field. — This bleaching or steeping
in alkaline lye, leaves in the cotton, however
well washed, some earthy matter, which
being unequally distributed, wants, when
the cotton is to be dyed, renders the application
of the colour unequal. This therefore is to
be removed by steeping in a dilute

vitriolic acid, which is capable of
dissolving & carrying off the earth. But
this acid is also to be carefully removed
by washing the cloth in water: otherwise
as it becomes dry, the acid, being
gradually concentrated by the eva-
poration of the water, will attack &
corrode the cotton. —

(By T. Henry) Memoirs
of the Literary & Society
Page 361 - Vol: 3 —

Aqua regia

~~Water of Life~~ Is made by dissolving sal-
-ammoniac in about four times its weight of strong
nitrous acid. —

This above dissolves gold &c

Nicholson's Ch. Dicty.

Singlasp glue. — *For Crayons &c*
Bruise it with
a mallet, ~~tear~~ tear it into shreds & cut them
into small portions. Then boil it in a
sufft. quantity of pure water. Strain the
decoction thro' a clean cloth & evaporate ~~the~~ water
from it over a ~~slow~~ slow fire untill it
be observed that some drops of it, put upon
paper, will assume the consistence of a ~~firm~~
trembling jelly when cool. In this state
it will keep 5 or 6 Days in summer & longer
in winter. Some delicate works require

only a slight concentration ~~off~~ in the solution
of glue. For example to fix crayons, by
Loriot's process, six or eight Deniers, or
from 150 or 200 grains of this fish glue,
rendered soluble in 16^{oz} of water which is
~~still~~ diluted with two parts of alcohol at the
time of its application, will be sufficient
to give the proper degree of strength to such
works & to prevent the powder from being
detached. The evaporation is very much favored by
the ~~alcohol~~ alcohol (spirit of wine).

The Painter & Varnisher's Guide. By P. J. Singry. —

Liquid verdigris for colouring maps

Put 1oz of pulverized verdigris into the bottom of a matrass, with 8 or 10 $\frac{3}{4}$ of good distilled vinegar. Place the matrass on a warm sand bath, & shake it from time to time, till the liquid has acquired a dark beautiful dark green colour inclining to blue. Leave the mixture at rest, that it may become clear, & pour it into a clean vessel, which must be closely shut. This preparation is used for colouring maps & prints. The colour may be lowered, if necessary, by adding a little water or distilled vinegar in the shell ~~to~~ into which the brush is dipped.

The painter & varnisher's Guide

By P. F. Tiquet. Professor of
Chemistry, natural history &
mineralogy in the academy of Geneva.

London printed for G. Bunsley, Fleet Street - 1804.
The above book was borrowed of J. E. G. L.

B Preparation of Wax for polishing Wood. —

Melt over a moderate fire, in a ~~very~~ vessel, 2 oz of white or yellow wax; & when liquified, add four ounces of good essence of turpentine. Stir the whole untill it is entirely cool, & the result will be a kind of pommade fit for waxing furniture, & which must be rubbed over them according to the usual method. The essence of turpentine is soon dissipated, but the wax, which by its mixture is reduced to a state of very great division, may be extended with more ease & in a more uniform manner. The essence soon penetrates the pores of the wood, calls forth the colour of it, causes the wax to adhere better, & the lustre which these results, is equal to that of varnish, without having any of its inconveniences.

This mixture may be coloured with alkanet root &c.

Varnish for Violins &c - slightly coloured
- Or for furniture of plum tree or mahogany &c

Gum sandarac 4^{oz}

Seed lac ——— 2 "

Mastic ———

Benjamin in tears } 1^{oz} of each.

Pounded glass — 4^{oz}.

Venice turpentine 2^{oz}

Pure alcohol — 32^{oz}

The gum sandarac & lac render this varnish
Durable: it may be coloured with a little
saffron or Dragon's blood.

D² Page 124

Copal varnish with ether — ~~Amber~~
For wood &c

Amber, copal 1/2^{oz}

Ether ——— 2^{oz}

Reduce the copal into fine powder, & introduce by
small portions into the flask which contains the
ether; close the flask with a glass or cork stopper,
& having shaken the mixture for half an hour,

leave it at rest for half an hour till the next morning. In shaking the flask, if the sides become covered with small undulations, & if the liquor be not exceedingly clear, the solution is incomplete. In this case add a little ether, & leave the mixture at rest. The varnish is of a light lemon colour.

The affinity which ether has for copal is so great, that when the powder is poured into the flask, some particles of it seized by the vapour as it escapes from the flask, soon form the small stalactites, extending from the extremity of the card which supports the powder to a considerable distance ~~from~~ within the mouth of the flask. The attraction of iron filings, put ~~into~~ in motion by a magnet produces a similar appearance.

^{or 2} The largest quantity of copal united with ether may be a fourth, or the least a fifth.

The use of copal varnish ~~united to ether~~ made with ether seems, by the expense attending it to be confined to repairing those accidents which frequently happen to the enamel of toys, as it will supply the place of glass

to the coloured varnishes employed for mending fractures, or to restoring the smooth surface of paintings which have been cracked & shattered. The great volatility of ether, & in particular its high price, do not allow the application of ~~it~~ this varnish ~~to~~ but for the purposes here indicated. It has been applied to wood with complete success, & the glazing it produced united lustre to solidity. In consequence of the too speedy evaporation of the liquid it often boils under the brush. It may be retarded by spreading over the wood a slight stratum of oil of rosemary, or lavender, or even of turpentine, which should afterwards be removed with a linen rag: what remains will be sufficient to retard the evaporation of the ether.

L^d.

To clear wine

Powdered & washed sulphate of barytes - thrown into the vessels containing muddy wine will clear it, the particles being heavy & easily sinking to the bottom.

W. Watson.

Varnish - for philosophical instruments
for cast or moulded articles with which
furniture is ornamented &c. - This
varnish is called - changing varnish - or varnish
destined to change or modify the colour of those
bodies to which it is applied. *André* for varnishing
brass nails &c. at Geneva.

Gum gutta $\frac{3}{4}$ oz

Gum Sandarac - 2 oz

Gum elemi - 2 oz

Dragon's blood best sort 1 oz

Seed lac - 1 oz

Terra merita - $\frac{3}{4}$ oz.

Oriental saffron 12 grains

Pounded glass - 3 oz

Pure alcohol - 20 oz

The tincture of saffron & of terra merita is first
obtained by infusing them in alcohol for 24 hours
or exposing them to the heat of the sun in summer.
The tincture must be strained thro' a clean
linen cloth, & ought to be strongly squeezed.
This tincture is poured over the dragon's blood, the
gum elemi, the seed lac, & the gum gutta,

All powdered & ~~very well~~ mixed with the glass.
The varnish is ~~then~~ then made ~~with~~
according to the directions already given.

De
Page 127.

Copal varnish - for wood, iron, brass,
copper, used also for painting waiters,
Argand's lamps &c

Copal (picked) 16^{oz}

Prepared linseed oil or oil of ~~pink~~ white poppies } 8^{oz}
(improperly called oil of pink) —————

Essence of turpentine — 16^{oz}

Liquefy the copal in a matrass over a common
fire, & then add the linseed oil, or oil of pink,
in a state of ebullition: when these matters are
incorporated take the matrass from the fire, stir
the matter till the greatest heat has subsided,
& then add the essence of ~~turpentine~~ turpentine warm.
Strain while still warm, thro' a piece of
linen, & put the varnish into a wide mouthed
bottle. Time contributes towards its clarification;
& in this manner it acquires better qualities.

In general there is much advantage in not 77
employing too violent a heat. The varnish
by these means succeeds better, & acquires less
colour. If it afterwards becomes too thick,
add a little warm essence, that the mix-
-ture may take place more speedily.
It was in this manner that the celebrated
Martin composed his beautiful white fat
varnishes.

No
Page 195

Flowers of Zinc.

Sublimated oxide of zinc is obtained by
fusing that metal in an earthen ~~buttle~~
tube, which performs the office of a crucible,
& which is placed obliquely in a reverberating
furnace, or in any other capable of producing
a heat ~~capable of any other~~ sufficient to
make it enter into fusion. The metal
then soon inflames, & emits thick white
fumes, which if the zinc be pure, are
converted into very white woolly flakes.

72 These flakes, which adhere to the sides of the tube, are called sublimation oxide of zinc (flowers of zinc). — If the zinc contains iron the oxide is of an orange-yellow colour: the metal is purified by throwing into it, while in fusion, some pinches of the flowers of sulphur:

$\frac{1}{4}$ lb sulphate of zinc (white vitriol) or flowers of zinc. —
1 lb Nut or poppy oil & as much white lead as will make it of a proper consistence for oil painting. 387 20° Page. 299.

Oil of white oil for painting

Nut-oil
or Oil of white poppies (improperly called oil of pink)
D₂

Bright red — is made by a mixture of lake with vermilion & employed by painters for the sanguine parts.

L₂
Page 408

Varnish for wood

1 Pint of Alcohol

6^{oz} Shell lac

1^{1/2}^{oz} Gum juniper

~~These to~~ To be pounded in a mortar.
separately the shell lac to be put into the
Alcohol half an hour before the gum juniper.
The whole to be put into a bottle & shook
every quarter of an hour for a whole
day. This varnish should be applied to the wood
very quick as it almost instantly dries. ^{As mentioned to W. Peal}

Court plaster

Boil Isinglass (fish glue) & let it soak
in warm water 24 hours: expose it to a gentle
heat to dissipate the greater part of the water;
& supply its place with colourless brandy, which
will serve on the gelatin (fish glue). Strain the
whole through a piece of open linen, & take
care that the quantity of the excipient be

such that on cooling it shall form a
trembling jelly. Extend a piece of
black silk on a wooden frame, & fix it in
that position by means of tacks or pack-
-thread. Then with a brush made of
hair apply the glue, after it has been
exposed to a gentle heat to render it liquid.
When this stratum is dry, which will
soon be the case, apply a second, & then
a third or according to the desired thickness.
As soon as the whole is dry, cover it with
two or three strata of strong tincture of
balsam of Peru. This is the real court
English court plaster: it is pliable & never
breaks; characters which distinguish it
from so many other preparations sold under
the same name. When it is to be
used, moisten ~~the~~ it with saliva on the
side opposite to that which is varnished.

The painter & varnisher's guide
by P. F. Tingley

Oil Cloth

7/5

Mix Spanish white or tobacco pipe clay with water & free it from impurities. Dry ^{drying linseed} the mixture it & mix it with oil rendered drying by litharge, in the proportion of one fourth of the weight of oil. Spread it over the cloth with a spatula, when dry apply a second stratum & when it is again dried make the sub-
the inequalities of the cloth down by a ~~smooth~~ pumice stone stone reduced to powder, & rubbed on with a wooden cloth or cork dipped in water. A whole pumice stone may be used if the surface be made smooth. The cloth must then be well washed in water to clean it; & varnished with gum lac dissolved in linseed oil, boiled with turpentine, & which is liquefied by essence of turpentine if necessary.
Mix diff. substances with clay according to the

76
colour that is desired. — For finer cloth or
silk — the oil of white poppies or nut oil
may be used & varnished with that kind of
varnish described ⁱⁿ ~~at~~ page 70 of this book.
This last may be more extensively useful by
applying it to boots & shoes to render them
water proof. —

De
Page 473.

To measure heat with an instrument made
of two kinds of metal — is ^{hinted} ~~suggested~~ by
Richardson in his Chem. Dicty. under Expansion.

Dr. Handliffe made a convenient one by rolling
together zinc & platina

To make excellent tea cakes

274

Take new light barm - a little more than
is usual for making bread - Dry the flour well
before it is made up. ^{beat the yolks of eggs & mix with it} Get new milk warmed
& a little butter ~~not~~ melted in it - mix this
very slightly with the barm. Then work
the flour with this mixture, but not to
knead it - do it so as but just to incorporate
- let it stand half an hour - ^{then} make it into
cakes & place them upon a tin & cover them
with a light cloth - let them stand near the
fire to rise - then put the tin with the
cakes upon it into the oven. -

1 Lt Flour

4 Yolks of Eggs

1/2 Pint of milk

Butter but very little. -

1 Table spoon full of barm

A little salt -

M^{rs} Bennet

78 Dyeing — (Analyzed Wool Silk & Cotton —)

In destructive distillation, wool yields much impure volatile alkali, a portion of empyreumatic oil, leaving about one fifth of incombustible fixed residue. — Silk affords less volatile alkali & little oil, but some acid, leaving little coal which may for the most part be burned by calcination in the air and more residue. Cotton affords no volatile alkali & little oil, but some acid, leaving little coal which may for the most part be burned by calcination in the air.

Berthollet distilled nitrous acid from silk, & obtained saccharine acid, with a greasy matter, which, though it at first congealed on the surface of the liquor in the receiver, was afterwards dissolved in it by means of heat, even though diluted with water with which it passed through the filter. Wool also afforded the same greasy matter, & acid of sugar; the last of

which was more abundant in quantity than ²⁷that
obtained by the same treatment from any other
substance. But the oily part of vegetables was
totally destroyed by similar treatment, no greasy matter
being afforded; & on ~~analysing~~ analysing cotton,
he obtained ~~saccharine~~ saccharine acid, but no other
product; & the quantity was far inferior to that
yielded by animal substances. It was
remarkable that the cotton left no residue,
but was entirely converted into elastic fluid
& saccharine acid, which last is likewise easily
convertable into the permanently elastic fluid,
acid, which last is likewise easily convertible
into the permanently elastic acid, called fixed air.

Mr. Henry in his remarks on these experiments,
appears to think that the chief difference of ~~these~~ between
the animal & vegetable substances consists in the former
containing a more abundant greasy principle, soluble
in a watry menstruum, which the more sparing
portion of oil in the latter is not; & likewise in the
animal substance containing alkali, or at least
one of its component parts: whereas the vegetable

affords acid. On these circumstances indeed the different modes of treatment evidently depend. So that it is remarkable that vegetable substances, whose oil is wholly destroyed by nitrous acid, & to whose texture the mineral acids are in general injurious, will bear steeping in solutions of caustic alkali of such strength as would prove totally destructive to wool."

"Cotton & Linen are cleared of a tinging matter, which Mr. Kirwan finds in the latter to be neither gummy nor ~~resinous~~ resinous, but rather resembling lac. - Alkali's act upon this matter, & dissolve it after it has suffered a kind of combustion by exposure to air & the sun's light in the bleach grounds."

{ Nicholson's Chim. Dicty.
under Dyers.
See also Memoirs.

Black Dye

39

To dye cotton, black — Soak the cotton in
an infusion of galls, ^{then dry it.} ~~then dry it.~~ & afterwards
immersed in a solution of vitriol (or other more
proper ferruginous salt), the acid of ~~any~~ galls
being every where diffused through the
body of the cotton, will receive the
particles of calx of iron, at the very instant
of their transition from the fluid or dissolved,
to the precipitated, or solid state; by which
means a perfect covering of the black ink
matter will be applied in close contact with
the surface of the most minute fibres of the
cotton. This dye will therefore be not only
be more intense, but likewise more
durable - adherent & durable than when mixed
both solutions are mixed together &
the cotton steeped into it. —

Nich^l Chem. Dicty
under Dying. —

The above process does not make a permanent black but
becomes brown, by washing — It is much better to dye
the cotton blue first, then proceeding as above a fine
& durable black is obtained. — Smith. Family.

June 6th 1807—

Burned Silk grinds very finely with the Muller—It probably will make a good water colour & answer every purpose of indian ink. B

m

Gooseberry wine

To every gallon of cold water put four quarts of unripe gooseberries, bruised in a ^{marble} mortar, let the liquor stand in a tub two days stirring it repeatedly—let the liquor be run thro' a sieve & stand to clear, then to each gallon of the clear liquor put into the cask 3^{lb} of Lisbon sugar, stop the vent hole up, & lay the bung on light—the whole to be stirred up, two or three times a day, for 4 or 5 Days—stop the cask well up when it has done working. No barrow is put

in, it works well without. To each every ⁸³
12 Gallons put 1^{oz} of pulled iunglafs

The cask to be washed out with brandy before
the liquor is put in - to stand in the cask four
months. — A 12 Gal. Cask has stood six or seven months
A 9 Gal. barrel 4 or 5 Months. — If they stand too
long the wine is not so good. —

Wine that contains the most mucilage
is found to go sour the soonest; on
which account the iunglafs used to
retire them should ~~be~~ not be applied
until ~~a~~ ^{the} ~~beginning~~ ^{the} time of bottling.

Mr. Braces receipt
as sent to J. Bennet
at Doncaster

~~Wine that contains the most mucilage~~
~~is found to go sour the soonest; on~~
~~which account the iunglafs used to~~
~~retire them should be not be applied~~
~~until a the beginning the time of bottling.~~ — Parker's Chim. Cat. 256

Soda water

It Created vegetable alkali

1^{oz} oil Vitriol

8^{oz} pure water

10^{oz} take 8^{oz}

water & put in 1^{oz} oil Vit. by Degrees into
a half pint glass of water. & mix two tea spoon
ful.

then take two tea spoon ful
oil vit. with water & put it
an effervescence immediately takes place

Gregory & W. Seal

Tortoise shell imitation of in wood.

Mix together equal quantities of aquafortis & oil of vitriol - rub it over the smooth surface of fine white wood - then with a large pencil dipped in a mixture of thickish whiting & water mark those parts of the wood which are to remain a light colour - after which, hold the wood very near the fire & the unmarked spaces will become of any depth of colour desired in proportion to the time it is heat it receives from the fire - the whiting may then be washed off with water & the wood when varnished will very much resemble tortoise shell. - If the marked spaces are not sufficiently coloured rub them over with oil of vitriol & afterwards with aquafortis to give them a brown yellowish brown appearance. -

J. Smith.
Tansley

Mahogany colour on wood.

See the same receipt
Page 120 - for copying. -

Rub the wood over with oil of vitriol then with aquafortis - these give a colour to Dry Sycamore wood that very much resembles mahogany. - but is rather of too light a colour. -

July 1807.

When the wood is made hot either by ~~the~~ holding it near a fire or by a hot piece of Iron held near it, ~~the~~ it becomes black, ^{upon} ~~then~~ laying on the vitriol oil of vitriol; which may be changed with aquafortis to either a dark or light mahogany colour according to the time the latter is suffered to remain on the wood. When of the proper tint immerse the wood in water to prevent its becoming too light, take it out & let it dry in the air, then wash off the scurf ~~oil & varnish, as with other wood, as soon as possible after staining~~ the wood has become dry. {

Sept. 1808

Bleaching liquid

Let equal quantities of common salt & manganese be well mixed & put into a phial, & upon the mixture pour a quantity of vitriolic acid, fix one end of a bended tube in the mouth of the phial, & let the other end of it go nearly to the bottom of another phial which is more than half filled with water; then the vapour which rises out of the former phial will combine with the water in the latter, & this composes

=dition is the celebrated bleaching liquid. —

Student No. 1

Red paper - leather &c. If sealing-
- wax be dissolved in spirits of wine or
turpentine - it may be spread upon any
substance with a brush - in a very neat
manner - paper prepared with it retains its
flexibility without cracking & looks beautifully red.
- Paper of this kind will serve admirably for making
Pope boards & gift. paper ornaments on with black
figures would have a good effect. —

First tried on paper by B. Aug. 1. 1807.

To make a French Grey wash
for Walls

Take lime & let it fall in a dry place
mix it ~~it~~ with a solution of blue Vitriol
in water — The proportion as follows

1 Gal: Water
1 lb Nitriol

Dilute with sizing ^{instead of lime} W. S. Peal
The same process with white ^{of London} produces green.

Green paint, to stand the weather

Take white lead
Blue Nitriol
a few drops of water
Mix with linseed oil

J. Peal

Blue paint

La Grange says that the old painters used
oxide of cobalt mixed with oil. The sky & drapery
in some old paintings are of that substance, being the most
permanent blue that we are acquainted with.
Gaffney is an oxide of cobalt with silica mixed. Parkes Ch. Cat. 1419

Marking Ink

A solution of nitrate of silver mixed with a little
gum water forms the indelible ink formerly used.

Parkes Ch. Cat. 364

To make leather water-proof--

Take 1 Pint drying oil

2 oz. yellow wax

2 oz. Spts of turpentine

1 oz Burgundy pitch

To be carefully melted together over a slow fire. If the smell be unpleasant add a few drachms of some cheap essential oil, as of lavender, thyme, & the like.

Literary Miscellany

Milk Paint

Milk that has had the cream taken off	2 Lbs
Fresh slaked lime	8 oz
Linseed oil	6 oz
White Burgundy pitch	2 oz
Spanish white	3 lbs

The lime to be slaked with water exposed to the air & mixed in one pint of the milk. The oil in which the pitch is to be dissolved, to be

89

added by degrees to the lime & milk then
the rest of the milk - afterwards the spanish
wife. —

From Mr. Goodwin's Receipt

Phosphuret of Lime is
formed by putting some fragments of phospho-
rus at the bottom of a glass tube, coated with
clay, over which five times its weight of lime
is to be placed. The phosphorus subliming will
directly unite with the heated lime, & form
a solid brown mass, which on the addition of
water gives out phosphuretted hydrogen gas.
If the phosphorus be diffused through a
larger portion of lime it affords a powder which
which burns with a phosphoric light on being
dispersed in a warm air.

Oxygenated muriate of pot-ash & phosphuret
of lime being put into a glass of water,
& sulphuric acid added, the phosphuret is seen

to burn under the water; fire at the same time bursting from its surface.

Parkinson's Chem. Pocket Book
Page 31.

Hydrogen gas - of greater heat than common for melting metals &c.

Make a solution of zinc in muriatic & sulphuric acids - which holds in combination a portion of the metal. A stream of this gas recently prepared, will occasion, on being inflamed, the fusion of platinum wire, which the pure gas will not do.

This Hydro-zincic gas may be obtained by passing the vapour of water over a mixture of calamine & charcoal in a porcelain tube, placed horizontally in a furnace, & made red-hot. The gas in consequence of this combination, burns with a blue flame.

If confined any time over water, the
zinc is decomposed on its surface.

Parkinson's ~~Practical~~ Page 12
Chem. Pract. Book. -

~~In 2~~ - Precipitate of Zinc Sulphide of Zinc

In 2 lbs of saturated solution of sulphate of
zinc put 1 oz of nitric acid, then by the
addn of pot-ash the excess of acid is
saturated, & a white substance soon becoming
yellow, is precipitated; when ^{the} white parts
are discoverable in this yellow precipitate,
it may be concluded no iron remains in
solution. If the zinc contain manganese
carbonate of potash is to be added, but
short of the total precipitation of zinc; leaving
the fluid on the solution 2 or 3 days, that if
any manganese have been precipitated, it
may be redissolved by the acid, the zinc

precipitating in its place. The sulphate
of zinc thus purified will furnish the
fine white oxide of zinc so desirable
by painters. — Ann. de Chem. Cah. 103

Taken from Parbenax's Chem. Pocket Bk.
Page 172. —

To prevent paper, or ~~perhaps~~
muslin ~~also~~ from easily taking
fire. —

Draw common paper two or three times thro'
a boiling solution of one part ~~alt~~ alum,
in three parts water. —

Paper impregnated with alum
is used for whitening silver —
Rich. m. Dict. 4. Page 113

Wm. Glendinning's
Select Amusem. in Phil. & de
Page 135.

To make wax & water into a pomade
like pomatum. —

Put into a new glazed earthen pot six ounces of
river water, & two ~~at~~ ounces of ~~raw~~ wax, in

which, ~~to~~ put a dose of salt of tartar. ^{P. 3}
If the whole be then exposed to a considerable
degree of heat, it will assume the consis-
-tence of pomatum, & may be used
for cleansing the skin.

Select Amusement^s in Philology
By W. Glen Denning
Page 237.

To make Black Ink

- 1 lb. Nut Galls
- 6 oz. Gum Arabic
- 6 oz. Green Copperas
- 1 Gal. Water or Beer

Boil the galls & infuse them in a gentle heat
for 24 hours, without ebullition; then add
the gum in powder. When the gum is
dissolved, put in the green vitriol.
Strain the mixture & a fine ink will be
produced.

Yellow Ink, with saffron & gumbooge
D. Page 238

D.
Page 242

94

Sympathetic Ink (with cobalt)

Take saffron & dissolve it in aqua regia (nitro-muriatic acid) till the acid extracts every thing from it that it can; that is to say the metallic part of the cobalt, which communicates to the saffron its blue colour; then dilute the solution, which is very acid, with common water. If you write with this liquor on paper, the characters will be invisible; but when exposed to a sufficient degree of heat they will become green. When the paper has cooled they will disappear. If the paper has been too much heated the figures will become fixed. By drawing a snow piece it may be thus changed into a summer view by having that part of the picture which represents the snow done over with the above preparation.

Page 249

Iron shot

98

Bring a bar of Iron to a white heat & apply it to a roll of sulphur: * the iron will be immediately fused & run down in drops.

* Do this over a basin of water.

Do. Page 255.

Cement for piecing china

Sifted Calcin'd oyster shells & white of eggs ground together very fine on a stone. —

Do. Page 255

To take stains & dirt off prints

Spread out the print on a clean table or fasten it to fasten it down — sprinkle it with boiling water & spread it equally by a sponge — Repeat this 3 or 4 times — the ^{dirt} stains then dissolve & extend themselves on the print. ¹ Then put the print into a vessel stretched out; & cover them with a boiling ^{of} lye of pot-ash, kept hot as long as possible. After the

96
whole has well cooled take out the prints with care; spread them on stretched cords, & when half dry press them between leaves of paper, in order that they may not contract wrinkles.

Q?

Black varnish used for toys made
of paper, ^{or paste} prepared in manner as —

Dissolve in a glazed earthen pot, a little colophonium or baited turpentine, till it becomes black & friable, & gradually throw into the mixture three times its as much amber finely pulverized; adding from time to time a little spirit of or oil of turpentine. When the amber is dissolved, besprinkle the mixture with the same quantity of sarcoella gum, continually stirring the whole, & add spirit of wine till the composition becomes fluid: then strain it through a piece of hair cloth, pressing it between two boards. This varnish, when mixed with ivory black, is applied in a

with
on
paper
les.
warm place on the dried paste of the paper
shavings; the articles are then put into a hot
hot stove; next day they are ~~res~~ removed
into a hotter stove & so on till dry.

D. Page 260

To copy the outlines of Drawings Prints or Paintings -

Take a glass plate, the edge of the picture
& spread thinly over it with a brush, the
white of egg - or gum water & vinegar mixed
- when dry lay it over the picture & draw
upon it with red chalk - -

D. Page 293

a black lead pencil probably may answer better than chalk
The figure may be retraced upon paper by ~~spreading~~
shining & placing the glass to a window with
the paper over it. - Gold-beathers skin is a
convenient thing to lay over pictures to be traced. -

Inflammable air

Put in a bottle with a wide neck 3^{oz} of oil or ~~spirits~~ of spirits of Vitriol, with 12^{oz} of common water, & throw into it at diff. times an ounce of iron filings. — If a lighted taper be brought near the mouth of the bottle a violent detonation takes place, & may be repeated as long as the effervescence is produced. — Dr. Page 243.

Golden ink.

Take powdered powdered white gum arabic, dissolve it in brandy & add a little common ~~salt~~ water to render it more liquid. Provide some gold in a shell which must be detached in order to reduce it to a powder. When this is done moisten it with the gummy solution, & stir the whole with your finger, or hair brush; then leave it at rest for a night that the gold may be the better dissolved. Dilute when necessary with gum water in

which saffron has been dissolved infused.⁹⁹
When the design made with this ink is dry
polish with a dog's tooth. -- This is the kind
of gold ink used ~~by~~ formerly by the
Benedictines in their curiously written
manuscripts.

D: Page 285

Blacking

2 Lb. Water } mixed previously
2 oz. Spirit of Nitric } one night before
the rest.

6 oz. Ivory black, or the best kind of Lamp black

abt. $\frac{1}{4}$ lb. Treacle.

Wm. Peal. for one kind of a servant of R.R.

The blacking made as above does not answer after it has been kept
awhile becoming a bad colour.

Chemical Books

Henry's Epitome of Chemistry, small 8 vo. 5/- 6/- ^{2 p}
~~Part 1st~~ ~~5/- 6/-~~

Part 1st is intended to facilitate to the student the acquisition of chem. knowledge -

Part 2nd On analyzing mineral waters, earths stones, ores &c

Part 3rd Instructions for applying chem. tests & reagents ~~to~~ to various purposes.

Parkinson's Chem. pocket Book 12 Mo: 6/- 6/- ^{6/-} Lymonds

Bishop Watson's Chem. Essays 5 vol: 12 Mo.

Murray's elem^t. of chem. 2 vol: 8 vo: 12/-

Other Philos.^c Books

Elem^t. of nat^l. Phil^y, explaining

Metzger's elem^t. of nat^l. phil^y. 8 vo, 6/- Johnson

Rutherford's System of nat^l. phil^y. 2 vol 4 to. 2. 2. -

Nicholson's introdⁿ. to nat^l. phil^y. 2 Vol: 8 vo: 16/- ^{6/-} Johnson

see Page 111

184

White Varnish for Drawings, said to be
of an excellent kind.

2 Quarts spirits of wine

1 lb Gum Sandarac

3^{oz} Gum Mastic (well powdered)

3^{oz} Camphire —

1/2 Pint oil of turpentine

Put the whole except the turpentine into
a ^{bottle} ~~tin vessel~~ or bottle, & set it near the
fire; when dissolved add the turpentine
by small portions stirring the mixture each
time; ^{keeping the bottle close stopped} Some people recommend boiling
the four first articles in ^a tin bottle.

— but the varnish may probably be made
without boiling — as first directed —

When dissolved & mixed with the turpentine
strain ~~thru a fine~~ it thro' fine linen
into a bottle, & if cool cork it up — in 2 or 3 days
it will be fit for use. It will varnish on

Black lead Drawings.

A colourless Varnish see p. 139.

Al. W. Seal's Receipt. from
Miss Clarke

Guanna — is the name given to a species of crocodile & lizard of which B^t has one in a bottle of spirits.

M. M. Watson

Luting for vessels exposed to great heat.

See also pages 11 & 13.

- Clay Sand & Lime tho' but a very small portion of the latter — mixed the whole together with the whites of eggs well beaten — or with the curd made with as little oily substances in it as possible — viz farmers whey curds. — Fat or oil being unfavourable for luting. —

Mr. Warltire —

Mr. Watson's recipe for stopping cracks & in iron utensils.

2^{lb} iron turnings or filings

1^{oz} sal. ammoniac

1^{lb} flour, of sulphur

Blend the mixture with water till of a proper thickness & use it fresh. —
 W. H. uses this to stop the joints of steam engines &c. — Parker's Ch. Cat. p. 529 —

Calico printing

~~Laundry memorandum relating to it~~

The colours that are too much in a liquid form for printing on calico, are mixed with flour till of suff^t thickness for the printing blocks to which prevents its spreading too far.

Geo. Pearson Jr.

Lilac may be made with extract of Brazil wood ~~and~~ when printed immerse the cal: in lime water which changes it into a lilac colour. — ~~Extract of Brazil~~ Decotions of Brazil wood & Pearl Ashes made a fine crimson liquid.

Cotton dyed with extract of Logwood is turned to a kind of blue by the mordant called iron liquor. This mordant is first impregnated into the calico.

Mr. J. Smalley

Burned ~~also~~ alum (powdered) is rubbed on the cushions of calico printers previous to laying on the mordant to remove any greasy substances that might have adhered to the leather. Rich. Grim Dicty. see allum

704

Bleaching liquor

7 lbs Salt

6 lbs Oil Vitriol

4 lbs Manganese

These are put into a lute vessel made of
 & set over a fire - a pipe conveys the gas into
 the bottom of ^{an} incinerator containing about
 100 gal. of water in which about 4 lbs of pearl
 ashes have been dissolved. - Then when the
 water is sufficiently impregnated the
 with the gas - the cotton is then immersed

M. J. Brady

1000
Electrical figures may probably be made
with dying substances mentioned in the Manchester
Memoirs Vol. 3. Page 366 - which require ^{additional} no basis
for attaching themselves to the cloth. viz.

Indigo
Archil
Safflower
Annatto

} The colours extracted from them by
alkaline salts or quick lime -

These are afterwards said not to stand the weather

Prepare a basis - as mentd. in the above Book Page 376. -

Clay or Argillaceous earth may be
obtained by dissolving (say equal weights) ~~of alumina~~
Alumina in Water - powdered volatile alkali (Sal. Ammoniac)
being added precipitates the earth to the bottom
of the vessel. The upper liquor is to be poured off
& the precipitate dried for use -

Crayons are made of Argillaceous earth mixed
with ~~coloured~~ colouring substances.

{ Nick. Chem. Dict.
see Alumina

See Alumina
Page 113 -

Red Sealing Wax

107.

1/2 Drim Lac,
2 Drims Turpentine
2 Drims Colophony
1 Drim Cinnabar
1 Drim Minium.

The lac & colophony are to be first fused, after which the turpentine is to be added, & lastly, the colouring matters.

Nicholson's Chem. Dicty. under Resin - page 779 2 Vol.

To dye Orange colour & Red

Macerate for a night 3^{Drims} of pot-ash with an equal quantity of common madder, then apply a boiling heat, put in the cotton & ~~after~~ boil it quarter of an hour - rinse & dry it, then soak it in a solution of allum & common salt - after which pass it thro' a solution of glue & at last dip it into a madder bath - this would be a fine full red - but if annatto be added to the preparation of madder & pot ash - a beautiful orange is obtained - which many dyers make use of - this orange is not so durable as the red.

Nich. Chem. Dicty. see madder 465

100.

To dye brown or coffee colour

See Rich.^d Chem. Dicty. Page 463. 1st Vol. - madder -

See a mordant for browns & colours. Page 466 - at the
marks $\sqrt{\frac{\text{viz a solution}}{1}}$ of nitre of lead - alkaline solution of arsenic.

To dye yellow

Extract the juice from the white flower

called (~~white flower~~) & immerse the

calico into it, that has been previously dipped
in a solution of fixed alkali & water. The bruised

white flowers ^{as above} produce little or no colour ~~still~~

the calico is ~~at~~ moistened with the alkali

which immediately ~~turns it~~ produces a
fine yellow. — (B. July 12, 1808.)

The above does not stand much washing & but will
probably be more durable by the assistance of mordants.

Quercitron is a kind of bark from America ~~called in English~~ there is a
yellow oak, which gives a yellow dye - so that 1 Part goes
as far as 10 of woad. & ~~is~~ ^{very} much cheaper - Rich.^d Dicty.
The Astringent - Sumach. gives a ^{very} durable yellow to cotton that has
~~previously been~~ the printers mordant acetous solution. ^{Do. see Sumach}
see Page 110 of this Book

Calico Printing

109

Red Figures — See Rich. Cris. Chirn. Dicty. under Maber
& Mordant for D. Page 469 — 1 Vol. — See a Mordant also in Page 294 ^{Dying Feb.}

The Printers Cushions & the blocks ~~used~~ in the calico
Manufactory, are rubbed with burning allum to remove
greasiness which might prevent the ink or colour from sticking

Cont. before

See Page 112 Allum

Oxalic acid is used by calico printers for same purposes not mentioned
in Parker's Chirn. Catalogue Page 239. — It is the juice of sorrel in
combination with potash. — See Page 238. — Wool was found by Berthollet
to contain more than half its weight of oxalic acid. — See Page 239 —
Tartaric acid is used to discharge false prints — See Page 240

Mordant for ^{printing} ~~dyng~~ linen red, which
will probably be proper for other colours &
for cotton. — ^{perhaps may be also} It also may probably used in dying.

1 lb. blue ⁱⁿ 10th hot water
3th allum
1th Sugar of lead
add 2^{oz} Potash
2^{oz} Powdered Chalk

The vitriolic acid of the allum falls down with the
lead. — The upper liquor is the mordant. — See Page 294 Dying

Mordant for Red & Yellow colour on Cotton
1 Gal: hot water } mixed & stirred a considerable time } Dry the calico after using the Mordant
3th Allum } & agitated during ~~several~~ ^{two} } in a hot stove.
1 1/2th Sugar of lead } or three days, when a few ounces of whit rare to be added
as a strong effluence encreases. The precipitate is vitriolic
the vitriolic acid of the ~~Sugar of lead~~ ^{allum} ~~is~~ ^{is} ~~added~~ ^{added} to the lead. The upper liquor is the
Mordant which should be mixed with gum for the blacks. — March: Memoirs 3 Vol. Dec 376

110

~~A Saffroned dye with Annatto~~
 Common Annatto which gives a colour
 inclining to saffron mixed with urine
 stains linen of such a permanent colour
 that it never can be washed out -
 afterwards says it is a mistake Rich.^d Dicty.
 see Annatto.

Yellow Dyeing

Gall of Copper is used as a mordant in dyeing with
 Yell.

Rhubarb produces a much less destructible yellow than
 other vegetables - It is not destroyed by aquafortis - See Rhubarb, Rich.^d Dicty.
 Volatile alkali heightens the colour of Rhubarb extract. - de de

Brown dye See Page 113 -

~~The juice of holly berries extracted whilst
 when they are green, gives a stain to
 muslin, similar to the juice of Walnut
 rind - which does not easily wash out, & will
 probably be very durable with the ^{assistance} preparation of
 a mordant. -~~

Chemical Books

A Dicty. of Chem'y. & Mineralogy - with an account of the most important Chemical Manufactures - By A & C R Aiken

Pr. for Jno & Arthur Arch, Cornhill
& Wm Phillips - London price 3/6 Guineas

Heat the most instance for chemical purposes may be produced from the mixture of ~~carburetted~~ hydrogen, & oxygen~~ized~~ gases. - Fill ~~a~~ two bladders one with the hydrogen & the other with oxygen connect them to a pipe so that on pressing the bladders the gases may unite & issue from a small orifice. - Fix stopcocks to the neck of each bladder & to the terminating pipe.

Throw the above mixed gases on burning charcoal. &c

Parker's Ch. Cat. 306.

Pomatum

Pomatum prepared with oxide of bismuth turns the hair black.

D. 412.

To dye a lead or pigeon colour
on cotton or feathers. —

Make a strong ^{Decoction} ~~Extract~~ from the seed pods of
the plant with hot water, or by boiling
in water; — steep the cotton into it & ~~let it~~
ring it out — when nearly dry dip it ⁱⁿ a
solution of green copperas & water which
will give it the desired colour. — This dye
does not wash out with hot water & soap,
tho it becomes lighter ^{& of a browner colour} by hand washing:
It probably may be made very perma-
nent by mordants: but for common
uses purposes it may answer without.

Discovered 2 Sept. 1808 B —

The leaves of the plant & equally as well
as the seed pods — see page 114

To dye buff colour ^{on} cotton #

~~Mmm~~ Made a strong decoction in water from
the holly berry whilst green; steep the
cotton in it when nearly dry. Immerse it
in a solution of green copperas which gives
a kind of drab. when this is again
nearly dry ~~immerse~~ ^{steep} the piece in strong
lime water or lime & ~~water~~ water as thick
as cream - immediately a buff colour appears,
but is not permanant without the cotton
is previously steeped ~~in~~ in the printers mordant
& prepared with alum & sugar of lead. -
R08 B

To dye a drab colour on cotton

~~Make~~ Prepare the cotton in the printers' mordant,
~~then proceed as stated above except making~~
~~use of any lime.~~ Then steep it in a decoction of
holly berries ^{gett} whilst green, after this is nearly
dry immerse the piece in copperas water. -
R08 B

To make the liquor called Pop-

2 Gal. water
 $1\frac{1}{2}$ lbs Sugar
 2 $\frac{1}{2}$ Ginger bruised
 2 $\frac{1}{2}$ Cream of tartar
 One Sliced lemon -

Boiled together, then to stand
 till blood warm, then put
 3 Spoonful of barm to it -
 which should ~~not~~ ferment
 about 12 Hours; then bottle
 the liquor off for use.
 Is ready to Drink in 24 Hours.

To make one Gallon of Pop
 After Receipt given to Dr. Medley
 by Mr. Sykes -

1 $\frac{1}{2}$ lbs Lump Sugar
 1 $\frac{1}{2}$ Cream Tartar
 1 $\frac{1}{2}$ Ginger
 Juice of one Lemon

1 Gal. water

to be added after boiling
 1 $\frac{1}{2}$ Spoonful of yeast to be added immediately after
 when about blood warm, to be bottled immediately after

Mr. Ince - J. W. Peal

To make the above liquor - J. T. Medley's Receipt
 being the same as the above, except its having $\frac{1}{2}$ lb sugar more.

2 Gal. water
 2 lbs Raw sugar
 2 $\frac{1}{2}$ Ginger bruised
 2 $\frac{1}{2}$ Cream of Tartar
 One Lemon sliced

A cheaper kind may be made thus.

Take 2 Gal. water
 2 $\frac{1}{2}$ Cream Tartar
 1 $\frac{1}{2}$ Ginger (bruised)
 1 lb White Muscovado sugar
 2 Table Spoonfuls of barm.

This is to be bottled as
 usual in 2 Days
 the liquor is very
 pleasant & cheap.

When boiled a very short time, pour it into a vessel
 & when about blood warm, add 3 or 4 table spoons
 full of barm; to stand 12 hours; then bottle & tie

down the cork. This liquor is ready in 24 Hours.

As soon as it is cold, it may be put into a bottle & corked. It is ready to use in 24 Hours.
 Dr. Percival esteems soda water as highly medicinal in
 pulmonary consumptions, & in malignant fevers.

Parquet Chem. Cat. 1833

Loda water

By great pressure water may be combined with more than twice its ^{own} ~~its~~ ^{half} of its own bulk of carbonic acid gas.

A description of a proper apparatus, may be seen in *Bouillon la Grange's Chemistry*. Vol 1. 93. —

De 343

Damp in mines

If carbonic acid gas, when a candle will not burn in it. — Quick lime let down in buckets & ^{gradually} sprinkled with water will absorb carbonic acid gas, — then if on letting down a candle it continues to burn, the workmen may descend. —

Perhaps water may be let down by its ^{own} ~~its~~ ^{weight} ~~weight~~ ^{by that means} ~~by that means~~ ^{the rope the whole depth & by that means} ~~the rope the whole depth & by that means~~ ^{best of all the water.} ~~best of all the water.~~ — Or throw water directly down the shaft. De 342

Solter

Off 8 parts ~~the~~ bismuth
5 " " lead
3 " " tin

This mixture is used by Mr. Houdart to which is fixed a thermometer to know the degree of temperature for hardening surgical instruments. No further abt is given in *Parke's Cases* page 346.

be melted together, the mixed metal will fuse at no greater a heat than 212° . — Tea spoons are made of this alloy in London to surprise those who are unacquainted with their nature. They appear like common tea spoons, but melt as soon as they are put into hot tea. — Lead, zinc, & bismuth melted together

may be kept in fusion on paper over a lamp. — Parke's Cases page 413.

To dye lead or pigeon colour, on cotton or
Feathers. }

Make a decoction of the leaves of the Pianot-
plant, steep the cotton into it whilst
hot, ^{but it will do if not boiling} & let it stay a day at least, ring it
out, & when nearly dry immerse it in copperas
water, which immediately changes it
into a fine lead colour: ring it out
gently & let it dry in the shade.

This ^{dye} ~~colour~~ does not easily wash out, but
sometimes changes to a kind of drab. It is
however a very convenient sort of dye,
being easily procured. — The dry seed husks
of the Pianot were first tried as mentioned in
page 112; but the leaves (probably the stalks) ^{will} do as
well. —

Sept. 6th 1808 — J

To make a yellow precipitate - & Dye,
~~in the form of powder~~ which may probably be
an useful powder for electrical figures. ~~in~~
~~the shape of dyeing matter~~

Make a strong decoction of the green leaves of
the tree ^{commonly} called Wickey (which bears poisonous red
berries) to which add strong & clear lime
water - & when it has stood awhile in the
vessel - decant or evaporate the water.

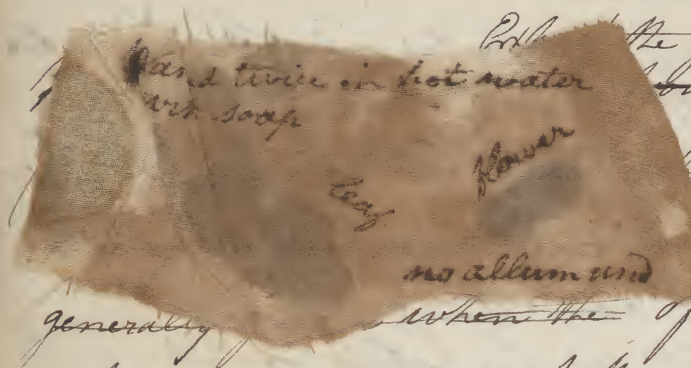
Cotton immersed in the decoction, & afterwards in
the lime water receives a fine yellow; but does
not stand washing. - This dye may probably be
made permanent by ~~a good~~ the printers mordant.
Discovered Sept. 9th 1808 B.

Imitation of petrification

If a small animal or vegetable be exposed to the
vapour of fluoric acid gas, drawn through glass -
the animal moisture will absorb the acid & the
silex of the glass (separated from it by the fluoric acid) will
be precipitated, so as to give it the appearance of a
real petrification, or an animal covered with stone.

Archers Chem. Cat. 232

To dye or print a dark colour with the Rusian plant


 Boil the juice from the leaves (either
 and twice in hot water with soap
 leaf flower
 then exposed to the
 no allum and some redish but are
 generally when the of the Scarlet Fusion

which will answer whether they have turned red
 or not by growing out of doors - immerse the
 cotton ~~it~~ in it which gives a stain, but when
 steeped in ^{green} copperas water it becomes a deep colour
 inclining to a purple - this dye (when the ~~leaf~~
 cotton was put into alum water a short time)
 was found the most permanent of any that
 I have yet tried, bearing ^{much} washing in soap &
 water ~~without~~ with but trifling injury to
 the ~~cotton~~ ^{colour}. This may therefore be a good article

for printing ~~cottons~~ on muslin.
 A decoction of the leaves will not answer near so well as the juice only.
 The flower of the plant answers better than the leaves. 1808-

When the cotton has rec^d the s^t or Fusion bath, & steeped in alkali or
 washed with soap, it becomes a fine green - but does not stand the
 action of the air, & sun,

To dye or print a dark colour with the Rusian plant

Express the juice from the
~~a strong decoction from the~~ leaves (either
~~crushed or red~~) which when exposed to the
for a ~~long~~ short time become redish but are
generally green when the of the Scarlet Fusion
which will answer whether they have turned red
or not by drawing out of Boors - immerse the
cotton ~~it~~ in it which gives a stain, but when
steeped in ^{green} copperas water it becomes a deep colour
inclining to a purple - this dye (when the ~~red~~
cotton was put into alum water a short time)
was found the most permanent of any that
I have yet tried, bearing ^{much} washing in soap &
water ~~without~~ with but trifling injury to
the ~~cotton~~ ^{colour}. This may therefore be a good article
for printing ~~cottons~~ on muslin.

A decoction of the leaves will not answer near so well as the juice only.
The flower of the plant answers better than the leaves. 1808-

When the cotton has rec^d the 1st or Fusion bath, & steeped in alkali or
washed with soap, it becomes a fine green - but does not stand the
action of the air, & sun.

To Dye yellow, of a kind of brown.

The black berries of a shrub ~~growing in hedges &c~~
(which B. first tried some from Oledale) on having
their juice expressed will give a fine yellow
to cotton ~~after~~ ^{on} the latter ~~has~~ ^{has} been immersed in
alum water; ^{or exposed to the air.} this dye does not ~~so~~ easily
wash out. and will probably be more durable
when the cotton is alumined previous to its being
immersed in the other liquor. or by using the
common mordants. — If the cotton is put into
copperas water it receives a pleasant looking
brown dye. —

Discovered 19. Sept. 1803. B.

See ~~note~~ the book for entering Dyes on Page 5th.

This may probably make a good stain for Argillaceous earth
to make yellow electrical figures with. —

A strong decoction made of onion peel gives a similar
kind of yellow on ~~being~~ the cotton being immersed in
Barbashes a solution of pearl ashes; which does not impart
any, or very little colour to the water in which it is
afterwards washed. If the cotton ^{be} dyed by the berries ~~as the~~
described above, & dipped into a solution of onion peel it ~~will~~
retains the colour much better. — ^{a general} mordant.
Memo: Try if ~~the~~ solutⁿ of Onions will serve as ~~the~~ mordant.

Sept. 24. 1803.

To Dye yellow, of a kind of brown. 19

The black berries of a shrub growing in hedges &c (which B. first tried some from Oledale) on having their juice expressed will give a fine yellow to cotton ^{on} ~~after~~ the latter ~~has~~ been immersed in alum water; ^{or exposed to the air,} this dye does not ~~not~~ easily wash out. and will probably be more durable when the cotton is allumed previous to its being immersed in the other liquor. or by using the common mordants. — If the cotton is put into ~~old~~ copperas water it receives a pleasant looking brown dye. —

Discovered 19. Sept. 1803. B.

See ~~note~~ the book for entering Dies on Page 5.

This may probably make a good stain for Argillaceous earth to make yellow electrical figures with. —

A strong decoction made of onion peel gives a similar kind of yellow on ~~being~~ the cotton being immersed in Barbas a solution of pearl ashes; which does not impart any, or very little colour to the water in which it is afterwards washed. If the cotton ^{be} dyed by the berries ~~as the~~ described above, & dipped into a solution of onion peel it ~~will~~ retains the colour much better. — ^{a general} mordant.

Memo: Try if ~~the~~ solutⁿ of Onions will serve as ~~the~~ mordant.

To stain wood, mahogany colour, - or black

When the wood is made hot, either by holding it near a fire or by a hot piece of iron held near it, it becomes black upon laying on oil of vitriol; which may be changed into a mahogany colour by rubbing aquafortis over it; it becomes lighter according to the length of time the aquafortis is suffered to remain on the wood. - When of a proper shade, ~~immerse~~ ^{wash} the wood in water, let it dry in the air, then wash off the scurf; oil & varnish as with other wood as soon as possible after it has become dry. ^{that easily takes} Lycamore is a ~~kind~~ kind of wood ~~which takes~~ ^{that easily takes} ~~the~~ ^{the} ~~stain~~ ^{stain} -

Cont. Vols in Page 85

Dark Purple dye / inclining to black or ~~the~~ ^{black}
Immerse cotton in the expressed juice of Acorns,
then in Copperas water - ~~immediately~~ the colour appears
immediately. - This will do for printing on Calico.
The juice of the false Chestnut gives the same stain with
Copperas, but not so deep. - B - 11 Oct. 1808 -

To dye a kind of lead colour on cotton

121

Make a decoction of the peel of walnuts
(viz the peel of the kernel) - dip in the cotton, &
when nearly dry immerse it in copperas water.

Recd: Oct. 1808 - B

The above dye is similar to that made of acorns
& also the pignut leaves - when immersed in copperas
& changes like them to a kind of reddish brown
on being washed with soap. It does not ~~easily~~
easily discharge ^{its} colour by washing.

See also Page 125.

Mahogany coloured stain for wood *

2^o of Red wood (of the Shops)

2 — Brazil wood

2^o Logwood

1^o Oil of vitriol

1^o Alum

Boil these together in 2 Quarts of water, except the two last

which should be added afterwards. The quantity of ~~nitric~~ oil of Nitric acid should be such as to produce the desired shade on the wood; the more it receives of that acid the darker will be the colour. — When the staining liquor has been rubbed on the wood with some lards or tallow & the proper colour given to it, rub ~~the~~ it ~~on~~ over with some linseed oil. — or dip it ~~in~~ in water to prevent the colour from becoming too deep; owing to the liquor acting too long on the wood. —

Joseph Taylor
Communicated by Joseph Walter

+ Archill boiled & a little ~~aqueous~~ nitrous acid added is said to be much better for making a mahogany colour than the above.

Brewing &c

To procure the vinous fermentation the liquor should be subjected to no lower a degree of heat than that of 55° of Fahrenheit. —

Parker's Ch. Let. 347.

Lac Varnish

123

2^{oz} shell lac

1^{oz} Annatto

1^{oz} Turmeric

30 Grain fine Dragon's Blood

20^{oz} Alcohol — in a gentle heat. —

Nicholson's Chem. Dicty. Page 960. —

Black Ink

4^{oz} Logwood - boiled near an hour in

6 Lbs. Water - (beer measure) supplying the waste during
the boiling & afterwards
add water to make up five quarts,

20^{oz} Galls. ... to this liquor strained off whilst hot, add
when cold 20^z. galls coarsely bruised,.

4^{oz}. Sulphate of Iron calcined to whiteness,

1/2^{oz} Acetate of copper, first moistened & pounded into a paste,

3^{oz}. Coarse brown sugar,

6^z Gum Arabic or Senegal.

For ordinary purposes, half the quantity of the two
latter ingredients may suffice. —

Cookinson's Chem. Dicty. Desormeaux. Phil. Mag. —
Page 166

~~The~~ Writing in common ink may be effaced by $\frac{1}{2}$ diluted oxymuriatic acid, & may be again restored by dipping the paper in a weak solution of sulphure of ~~ammonia~~ ammonia or of the prussiate of pot-ash, to which a few drops of the sulphuric acid have been added.

Old writings may be revived by a similar employment of these substances.

To prepare inks which will not be effaced by the oxy-muriatic acid, indigo & the oxide of manganese may be added.

Parkinsons Ch. Ph Book Page 167.

By an apparatus to prevent the gases from escaping particularly the carbonic acid gas, calcareous spar, limestone, chalk, marble & even common coal, were fused by Dr J. Hall.

Parker Chem. Lab. 1791

Dyeing, - Lead colour.

125

The plant - which bears a number of ~~the~~
small pink flowers & grows in moist places, its seed
pods are very small & curl up when it sheds its seed.
~~the green leaves of this plant~~ will produce an
extract on expressing the leaves, that will dye a kind
of lead colour (similar to the plant leaves) on the
being cotton being immersed in copperas water.

Memo: This does not dye so strongly as the plant. nor does it answer
well to add any water to the leaves. —

Sample of the above dye -
unwashed. — }

washed once over in cold water with soap.

Dying, Lead colour

125

The plant which bears a number of ~~the~~
small pink flowers & grows in moist places, its seed
pods are very small & curl up when it sheds its seed.
~~the green leaves of this plant~~ will produce an
extract on expressing the leaves, that will dye a kind
of lead colour (similar to the plant leaves) on the
being cotton being immersed in copperas water. —
Tinct. Wray 1809. B.
Memo: This does not dye so strongly as the plant. nor does it answer
well to add any water to the leaves. —

Sample of the above dye —
unwashed. — }

washed once over in cold water with soap.

Dye - Olive green or drab

The white flower & green leaves of the pig nut which grows in most fields, on having the juice expressed will give ~~the~~ to cotton the olive green colour as below on being immersed in copperas water -

This is similar to the colour produced by holly berries in the same manner. *see page 113.*

Dec: 19 May 1898

Sample - unwashed

— Washed with soap in warm water once over.

Cement

Cement may be made with common lime that will harden under water by the following recipe -

4 Parts grey clay

6 lb. Black oxide of manganese

90 lb. good limestone reduced to fine powder;

calcine the whole to expel the carbonic acid.

When cooled, work it into a ^{mortar} paste with sixty parts of washed sand. If a lump of this cement be thrown into water, it will harden immediately.

Refined Ch. Cat. 5 pp. —

Oxygen Gas

1st May be procured from the black oxide of manganese, heated to redness in a gun barrel, or in an iron or earthen retort; or from the same oxide, heated by a lamp in a retort or gas bottle, with half its weight of strong sulphuric acid.

2nd From the red oxide of lead, (common red lead) heated either with or without sulphuric acid.

3rd From nitrate of potash (common salt petre) made red hot in a common gun barrel, or in an earthen retort.

Or from ~~nitrate of pot~~ oxygenized muriate of potash, heated in a small glass vessel retort, over an Argand's lamp. The oxygen gas thus produced, is much purer than that obtained in any other mode, especially the last portions, which should be kept separate.

Henry's Epitome of Chemistry
Page 59.

Carbonic acid gas

To obtain this gas, ~~first~~ put a little powdered marble or chalk into a common gas bottle pour upon this sulphuric acid, diluted with 5 or 6 times its weight of water. & gas will be produced which those who have an opportunity may receive over mercury; but a mercurial apparatus is not absolutely essential, since the gas ~~may~~ ^{may} be collected over water, if used immediately when produced.

Henry's Epitome
of Chemistry

Blue Dye

Indigo is the only substance used in dyeing blue, which it does without the intervention of a basis. In its ordinary state it is insoluble in water, & in any other solvent except sulphuric acid. When thus dissolved, it is sometimes applied directly, in a diluted state, to the fabric; & dyes what is termed a *Saxton blue*. But, by the abstraction of part of its oxygen, indigo becomes soluble; & its colour changes from blue to green. It recovers the former

colour, however, on exposure to the air, by again absorbing oxygen. Its de-oxygenation is effected by allowing ^{it} to ferment, along with bran, or other vegetable matter; or by decomposing, in contact with it, the green sulphate of iron. Substances thus deprived of oxygen, are green, & acquire a blue colour by exposure to the atmosphere. By this revival, the indigo again becomes insoluble, & fitted, therefore, for affording a permanent dye.

Henry's Epitome of Chemistry.
Page 276.

Yellow Dyes

Wild American hickory, sumach, turmeric, guskie, & quercitron bark; with aluminous base the quercitron bark yields a bright yellow; with ~~oxide~~ oxide of tin, all the shades from faint pale-lemon colour to a deep orange; & with oxide of iron, a drab colour. With the addition of Indigo, it gives a green.

Id. Page 277

Black see also Page 135

A combination of red Oxide of Iron, with gallic acid & tan, is the principal black colour. In calico printing, white spots or figures, on a black ground, are produced, by previously printing on the cloth a protecting paste of citric acid⁺, thickened with gum or flour. The parts to which this ~~the~~ paste is applied do not acquire ~~the~~ receive the black dye, but remain perfectly white. —

* Citric acid is made from the juice of the lime, or lemon. It is ~~found~~ in extracts of a brown colour, but when pure they are white. It is not called spalic acid, as Boerhaave's Chimie Medicinale says. J. Page 277.

It is dark in crystals of a brown colour, but when pure they are white.

Diff. not called sp. alia d. dit, see Parker's Chiro. later in Page 264. I. Page 264.

Ink to stand the effect of
acid fumes - on labels - see - D. Page 233

Tan

The watery solution of tan, poured into one of gelatin or jelly (viz Kinglap dissolved in water) in the proportion of 10 grains to 23) converts it into coagulum, insoluble by boiling water - which forms the tanning principle.

De 27/9

Alumine - ~~in~~ argillaceous earth or Clay -

May be obtained by precipitating a solution of alum^(viz sal ammoniac) in water by the crystallized carbonate of potash.

It is however combined with carbonic acid. To secure its complete purification from sulphuric acid, ~~Gay~~ Gayton advises that the precipitate be redissolved in nitric acid, that nitrate of barytes be cautiously added to the solution, till it no longer occasions milkiness, & that the alumine be afterwards precipitated or separated from the nitric acid by heat. —

L. Page 96.

By a small portion of carbonate of potash, it does not precipitate but on adding more the alumine falls down. L. Page 139.

Lime — to find what quantity of ~~calcareous~~ argillaceous earth it contains.

Let a given weight be dissolved in diluted muriatic acid. Let a little excess of acid be added, that no portion may remain undissolved owing to the deficiency of the solvent. Dilute ~~divide~~ with distilled water, let the insoluble part, if any, subside, & the clear liquor be decanted. Wash the sediment with farther portions of water, & pour it upon a filter previously weighed. Dry the filter, and

ascertain its increase of weight, which will indicate how much insoluble matter the quantity of lime submitted to experiment contained.

It is easy to judge by the external qualities of the insoluble portion, whether argillaceous earth abounds in its composition. —

— Clayey lands require lime the most free from argillaceous earth. — That which contains much silex & little argillaceous earth, is the most proper to mix with lime the most argillaceous.

D^r. Page 393. —

Lime containing Magnesia is very noxious to land when added in great quantities. The stone abounds in the neighbourhood of Doncaster & Matlock — is hard, & often spotted with black spots upon it. — D^r.

To remove Fruit or Wine Stains.

By oxygenized muriatic acid. — Thus prepared:

Put about a table spoonful of muriatic acid into a tea cup, & add to it about a tea-spoonful of powdered manganese. Then set this cup in a larger one filled with hot water. Moisten the stained spot with water, & expose it to the fumes that arise from the tea cup. If the exposure be continued a sufft length of time, the stain will disappear. — This method will

This method will not do for any thing but ^{what is} white as ~~stained~~ ^{whenever} other colours. D^r. Page 416.

*This white may be bought of Sam^l. Parker, Chymist of
Haggerstone, near Shoreditch, London.*
Barytes a White powder for water drawings

Barytes - is an earth that makes an excellent white for drawings that never changes & may be mixed with other colours. To procure this

from carbonate of Barytes
earth consult Parker's Chem. Catechism Page 158.
To procure it from sulphate of barytes *as stated before* see Nicholson's
2nd Edition. Chem. Dicty. 309.

To dissolve the carbonate of barytes in very weak nitrous acid, by which the carbonic acid will be expelled, then by evaporation crystals of nitrate of Barytes will be formed. By a strong heat the nitrous acid will be expelled, & more pure deposited & pure barytes will be left in the crucible.

Carbonate of Barytes is found at the mine of Anglezarke near Chorley in Lancashire 3 miles east of Chorley. *Parker's Cat. 150*
Red Dye *From acid of carbonate of barytes see 380. Memoirs 399*

Is made from Cochineal, by adding supertartarite of potash. It is also produced by archil, madder & brazil-wood & safflower. The first is soluble in water, the four last, not without the intervention of an alkali. They are all adjuvative colours, but may be fixed on ~~the~~ the cloth by the oxide of tin. In the decoction of cochineal add the supertartarite of potash & afterwards the nitro-muriate of tin (oxide of tin). *J. Page 277*

Nitro-muriatic acid - for dissolving the tin.

Mix two parts of nitric acid with one of muriatic. This will also dissolve gold.

J. Page 190.

Protecting paste used by
calico printers - is made with the citric acid
see 123 Page, of this book under Hack. —

Selection of the light coloured Radish. scrapings
2
16 June 1809. —



With ^{a little} cream of tartar. when
cold. —



D. when warm &
the tartar dissolves. —

This may probably
make a good red ink
or a stain for paper
ornaments. —



D. with the tartar
dissolved & a little
nitric acid added. —

Oct. 1809 - This stain has now become considerably
more inclined to the lake colour. —

This is rather inclined
to scarlet - but will
probably change to a
purplish hue in a few
days. — This gave the

muslin a ^{bright} scarlet hue ~~of a bright~~ but on washing with soap it imme-
diately turns to a dark lake colour & soon after disappears on continuing the washing.
B3 —

Tin. or ~~Putty~~ or L

Oxydizing of scarlet requires the mordant of tin mordant. The most accurate proportions for a good solvent of tin, are two parts of nitric, & one of muriatic acid. — 22 Henry's B

Gun powder

a mixture of 5 Parts nitre
1 ——— sulphur
1 ——— charcoal

Each powdered very finely, separately; then mixed with water & beaten together with a wooden pestle. Granulated by passing thro' sieves, & dried. — Henry's Ep. of China Page 163

Fish packing up to send a distance.

As powdered charcoal adheres upon flesh meat, will prevent its being tainted for some time & even ~~restores~~ restores tainted meat. — would not ^{probably} powdered charcoal be the ~~most~~ most suitable, for packing up fish in a basket to send to any distant place. (B) — June 28 - 1809

Dyeing -

Dyers use Sal. ammoniac to hold the solution of tin from precipitating & to give their colours a deeper or different shade. -

The dyers call this ~~addition~~ ^{the composition} } Parker's Chim. Cat. 287.
} Page 203. -

Black powder

A good sort of indian ink may be made by burning ^{white} cotton muslin to charcoal & which grinds finely, & appears to be as good as the indian ink usually sold - probably raw cotton, prints or common calico may do. -

B July 1809

Mortar

Basalt when calcined & pulverized imparts to mortar the property of hardening under water.

Parker's Chim. Cat. 287.

There is reason to believe that tan is the source of the astringent principle in all astringent vegetables.

Parker's Chem. Cat.
Notes in Page 243. -

Hardening of lime

135

Oxalic acid (salt of sorrel of commerce) has the strongest attraction for lime of all the acids - & forms with it an insoluble substance.

Le. It would not make a good plaster with sand & lime for the outside of houses. Page 238 & 239. -
for caving fibrous, with proper addition of gravel &c. -
Parker's Chem. & Lab. 238.

Black dye

Galls & Copperas do not ^{immediately} produce a black dye, but require the cloth afterwards steeped in the liquor, when a little oxygenized muriatic ~~muriatic~~ acid has been added. D. Page 243 - note

Gallic acid

The gallic acid may be separated from the tanning principle by means of muriate of tin. The tin will unite with the muriate of tin & form with it an insoluble precipitate. There is reason to think that tan is the cause of the astringent principle in all astringent vegetables. Parker's Chem. 213.

Gallic acid & tan

The method of separating ^{gallic acid} from the tan is described in Expt. Chem. & Minerals for the year 1787. - The tan is separated by Muriate of tin will unite with tan & form an insoluble precipitate. See over leaf

~~precipitate, which by which the~~ The gallic
acid may be entirely freed from the tanning
principle by means of muriate of tin.
The tan will unite with the muriate of
tin, & form with it an insoluble ~~com-~~
~~posed~~ precipitate.

Crucibles may probably be made of powdered
Asbestos mixed up with the gum Dragacanth.
The Chinese are said to make their portable
furnaces with this composition -
*Asbestos is found in Corsica; in
the island of S. J. Sweden; in Cornwall, & the island of Anglesea in England.* Parkes Chim. Cat. 146.

Pure Silica

May be procured by fusing common flint stones with three or four
times their weight of potash, dissolving the product in water, & then
letting up the alkali by the addition of an acid, which will precipitate the
silica, which is to be well washed for use. The silicious stones
should be previously well heated red in a crucible, & plunged in that
state into cold water. This will render them brittle, so that they
may easily be reduced to powder before they are mixed with potash.

De 144

yellow part of the common
~~The white~~ The Marygold flower
prepared to the calico - which was
afterwards immersed in alum water
dried & washed with soap & warm
water - Laps. 2 - 1809. - This seems
likely to make a permanent stain for
calico, at least with respect to washing.

Expressed juice of the leaves of the
French Dock. — 31 Aug. 1809
unwashed. —

D. — the cotton dipped in lime water
turns it to a greenish yellow (31. Aug. 1809)

— Expressed juice of the green
leaves of the Jerusalem Cowslip
unwashed — 31 Aug. 1809

Obs. The leaves of this plant does not impart
its dying property to water either hot or cold
Decoctions will therefore not answer. The pure
juice expressed should be used. —

D. — washed with soap & warm water.

D. Dark Drab. produced by immersion
in ~~with~~ a solution of sulphate of iron.
Double dyed — or twice impregnated
with the dye. —

D. washed with soap & warm water
single dyed. —

The common mint
flower, pressed to the
calico. — unwashed

5 Lps. 1809 B

Water does not suffy extract the colour
from the flowers.

B. washed with soap &
warm water. —

B. unwashed, but dipped
in a solution of sulphate
of iron. —

B. washed after immersion
as above in sulphate of iron.

The flowers of the strong pepper mint produce
the ~~same~~ same colour as above; & no better;
apparently from a single trial that I made of it.
When the calico first receives the juice of the flower it is not
of so deep a colour as it afterwards attains by expo-
sure to the air.

Colourless Varnish

139

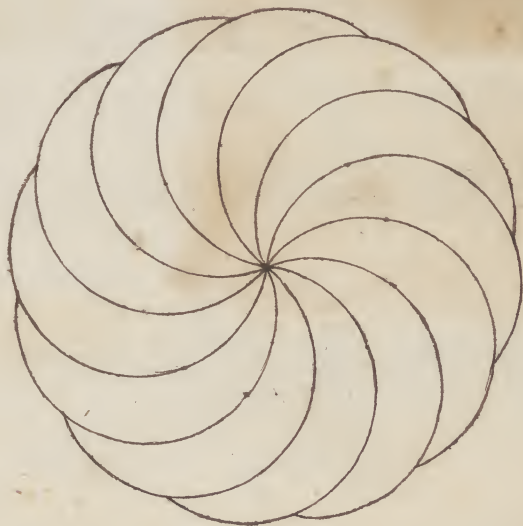
Resolve 8 $\frac{3}{4}$ of Gum Sandarach

2 $\frac{3}{4}$ Venice Turpentine

32 $\frac{3}{4}$ Alcohol or best spirits of ~~wine~~ wine,
by a gentle heat.

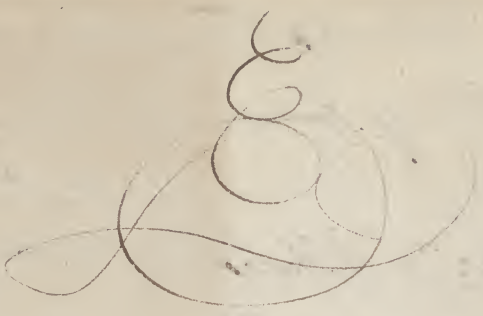
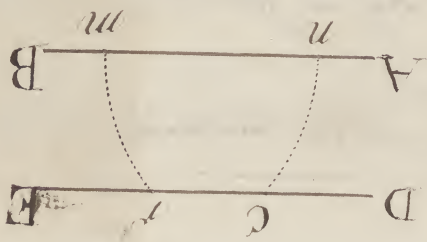
Wm. Peal's receipt

For a good white varnish for drawings see page 101.

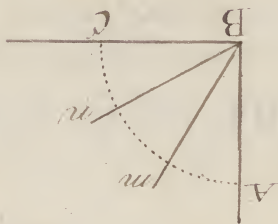


Case 2. When the Parallel line is to pass through a given Point C.

From any point m , in the line AB with the radius mc , describe the arc cn . - From the centre c with the same radius, describe the arc mt . - Take the arc in the compasses, & apply it from mt to n . - Through n & draw DE , the parallel required.

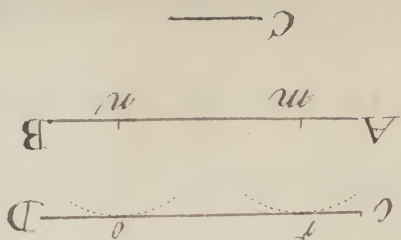


they will trisect the angle as required.



Problem 5. To draw a line parallel to a given line AB.
 (Case 1. When the parallel line is to be given
 distance c.

From any two points m & n , in the line AB, with
 a radius equal to c , describe the arcs r & o :
 Draw CD to touch these arcs, without cutting
 them, & it will be the parallel required.



Problem 2

To divide a given $\angle ABC$ into two equal parts.

From the centre B, with any radius, describe the arc AC. From A & C, with one and the same radius,

describe arcs intersecting in m.

Draw the line Bm, & it will bisect

the angle as required.

Problem 3.

To divide a Right $\angle ABC$ into 3 equal parts.

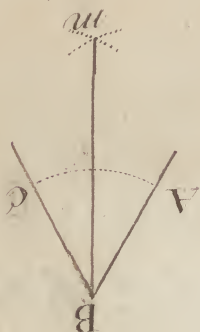
From the centre B, with any radius, describe the

arc AC. From the centre A, with the same radius,

describe the arc AC in m. (And with the centre C,

& the same radius, cut the arc AC in n. Then

through the points m & n draw BM & BN, and



Problems.

Problem 1.

To divide a given line AB into two equal parts.

From the centres A and B with

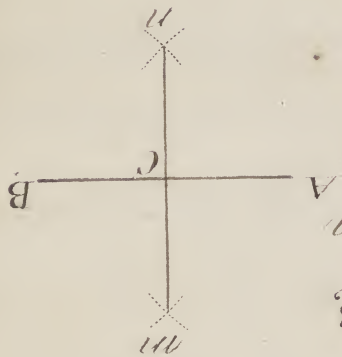
any radius greater than half AB,

describe arcs cutting each other in

m & n. Draw the line m n, & it

will cut the given line into two

equal parts in the middle point c.



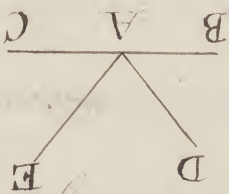


The measure of a right-lined angle, is an arc of
 any circle contained between the two lines which form
 that angle, the angular point being the centre; & it
 is estimated by the number of degrees contained in
 that arc. Hence a right-angle is an angle of 90
 degrees.

The right angle, is called the hypotenuse; & the other two sides the legs, or some times the base and perpendicular.

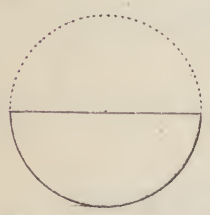
When an angle is denoted by three letters, of which

one stands at the angular point, & the other two on the two sides, that which stands at the angular point is read in the middle.



The circumference of every circle is supposed to be divided into 360 equal parts, called degrees; & each degree into 60 minutes, each minute into 60 seconds, & so on. Hence a semicircle contains 180 degrees, & a quadrant 90 degrees.

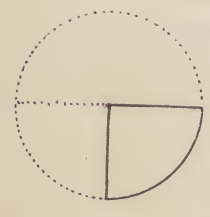
A semicircle is half the circle, or a segment cut off by a diameter.



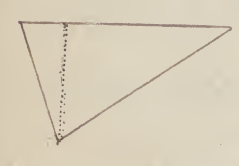
A sector is any part of a circle, bounded by an arc & two radii drawn to its extremities.



A quadrant or quarter of a circle, is a sector having a quarter of the circumference for its arc, & its two radii are perpendicular to each other.



The height or altitude of a figure, is a perpendicular let fall from an angle, or its vertex, to the opposite side, called the base.



In a right-angled triangle, the side opposite

The radius of a circle is a right

line drawn from the centre to the

circumference.

The diameter of a circle is a right

line drawn through the centre,

terminating in the circumference

on both sides.

In one of a circle, is any part

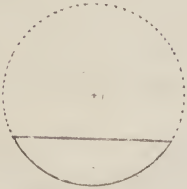
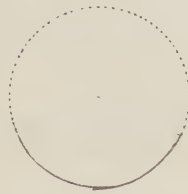
of the circumference.

A right chord is a right line joining the

extremities of an arc.

A segment is any part of a circle

bounded by an arc and its chord.



octagon, eight; a nonagon, nine; a decagon, ten;
an undecagon, eleven; and a dodecagon hath twelve
sides.

A regular polygon hath all its sides and all its
angles equal. — If they are not both equal, the po-
lygon is irregular.

The equilateral triangle is also a regular figure
three sides, and the square is one of four: the former
being also called a tetragon, & the latter a hexagon.

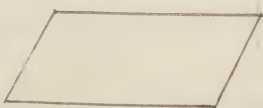
A circle is a plane figure bounded

by a curve line, called the circumference,
which is every where equidistant from
a certain point within, called its

centre.



A rhomboid is an oblique angled



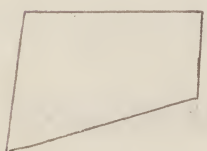
A rhombus is an equilateral rhomboid;



having all its sides equal, but its angles

oblique.

A trapezium is a quadrilateral which



have not both its pairs of opposite sides

parallel.

A diagonal is a right line joining



any two opposite angles of a quadrilateral.

Some figures having more than four sides are

in general, called polygonous: and they receive

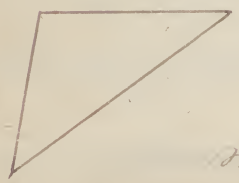
other particular names according to the number

of their sides or angles.

A pentagon is a polygon of five sides; a

hexagon hath six sides; a heptagon seven; an

The obtuse angled triangle has one obtuse angle.



An acute angled triangle has all its

three angles acute.



A figure of four sides and angles, is called a

quadrangle, or a quadrilateral.

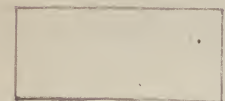
A parallelogram is a quadrilateral which has

both its pairs of opposite sides parallel. And it

takes the following particular names.

A rectangle is a parallelogram, having all its

sides equal, having all its angles right ones:



A square is an equilateral rectangle,

having all its sides equal, and all its

angles right ones.



A figure of three sides & angles is called a triangle. And it receives particular denominations from the

relations of its sides & angles.

(In equilateral triangle, is that

whose three sides are all equal.

(In isosceles triangle, is that which

has two sides equal.

(In scalene triangle, is that where

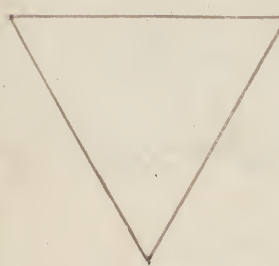
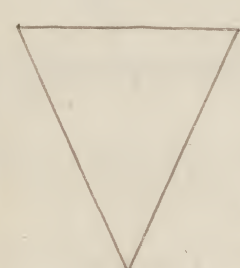
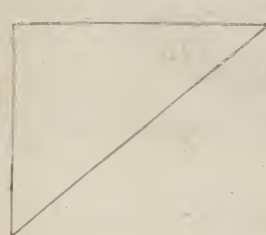
three sides are all unequal.

(In right angled triangle, is that

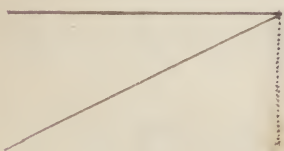
which has one right angle.

(In oblique angled triangle, is that

where either obtuse or acute.



The acute angle is less than a right



angle.

The obtuse angle is greater than



a right angle.

Surfaces are either plane or curved.

A plane, or plane superficies, is that

with which a right line may, every way, coincide.

But if not, it is curved.

Plane figures are bounded either by

right lines or curves.

Plane figures bounded by right lines

have names according to the number

of their sides, or of their angles; for they

have as many sides as angles; the least

number being three.

An angle is the inclination, or

opening of two lines, having different

directions, and meeting in a point.

Angles are right or oblique, acute

or obtuse.

A right angle, is that which is

made by one line perpendicular to

another. (When the angles are each

side are equal to one another, they are

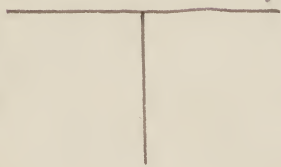
right angles.

An oblique angle is that which

is made by two oblique lines; & is

either less or greater than a right

angle.



Lines are either parallel, elliptic,

perpendicular, or tangent.

Parallel lines are always at the

same distance; and never meet,

though ever so far produced.

(Elliptic right lines change their di-

stance, & would meet, if produced,

on the same side of the least distance.

One line is perpendicular to another,

When it intersects not more on the one

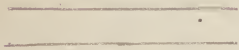
side than the other.

One line is tangent, or a tan-

gent to another, when it touches

it, without cutting, when both are

produced.



c. A Body or solid is a figure

of three dimensions, namely, length

breadth, and thickness.

Hence surfaces are the extremities

of solids; lines the extremities of

surfaces; and points the extremi-

-ties of lines.

Lines are either right or curved,

or mixed of these two.

A right line, or straight line,

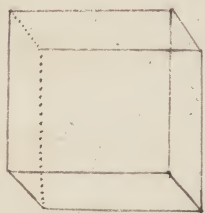
lies all in the same direction,

between its extremities; & is the

shortest distance between two points.

A line is continually changing its

direction, between its extreme points.



Practical Geometry

Definitions.

A Point has no parts nor dimensions, neither length, breadth, nor

thickness.

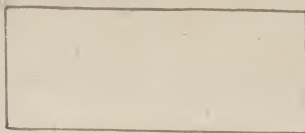
A Line is length, without breadth

or thickness.

A Surface or superficies, is an ex-

-tension, or a figure of two dimensions,

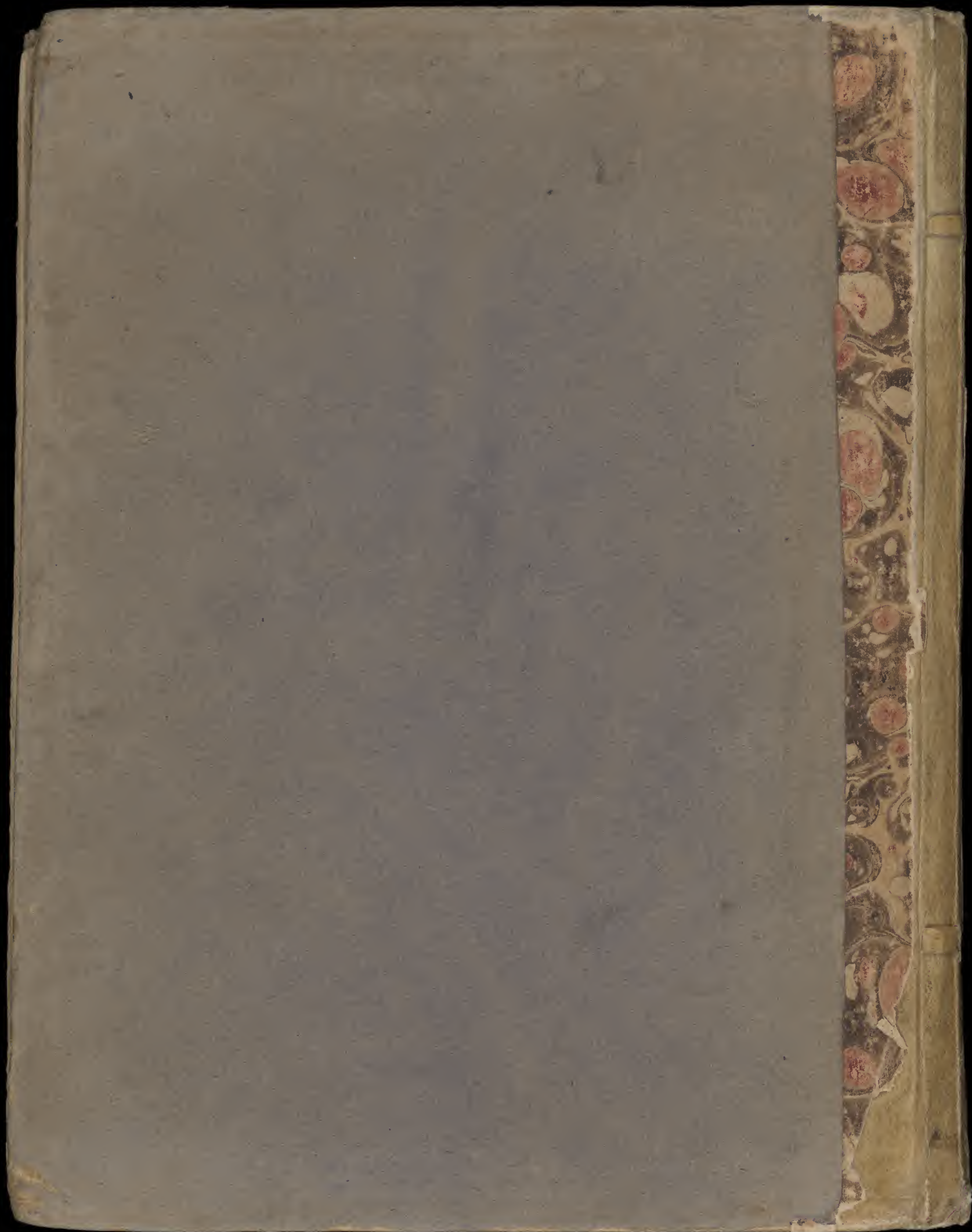
length and breadth; but without thickness.



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of 4 M. lianor called Psh.

Black Ink

1 lb. Nut-galls

6 oz. green Rosin

6 oz. green Saffron

1 Gal. Water or Beer

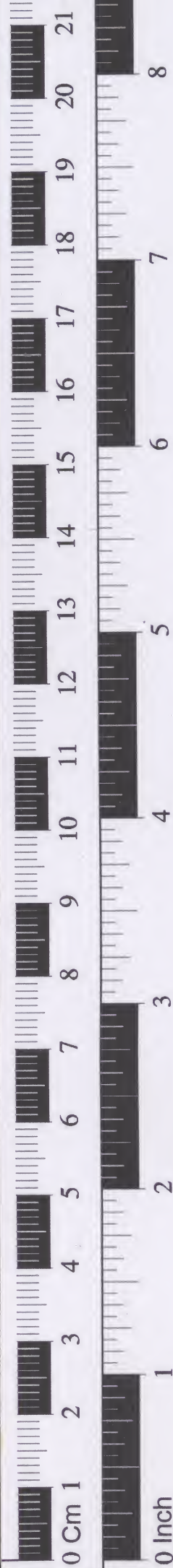
Boil the Galls & infuse them in a gentle
heat for 24 hours without boiling. add the
gum & when dissolved put in the green
vitriol.







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Substances used by Dyers
D - used by calico printers

Sal-ammoniac - is used to form what the
it is employed to prevent the tin from

Ammonia is also used for some purposes
Oxyd of lead
Arsenic, green
made
Dye
Orpiment

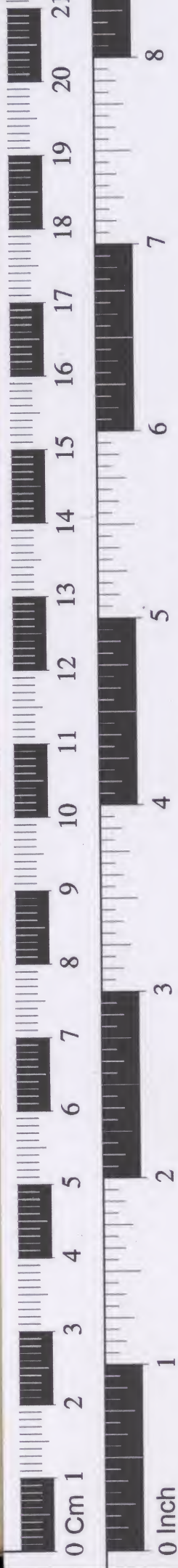


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